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Notes and Comments

Training the Salesman

TECHNICAL salesmanship promises to become an important topic in the chemical industry, and it is probable that in the near future some of the technical organisations will take steps to supplement the activities of the Government Committee on Education for Salesmanship, whose final report was issued last autumn. It is not inappropriate, therefore, to return to the report in the light of the present situation. The Committee, which was presided over by Sir Francis Goodenough, expressed the view that there was no " short cut " to efficiency in salesmanship. The successful conduct of commerce, in the Committee's view, calls for knowledge and wisdom derived from considerable experience as well as from sound general education. It calls also for the steady development of suitable personality by suitable education and suitable subsequent training in the principles and technique of commerce. It is of vital importance that all branches of commerce should adopt a systematic recruiting policy. The employer should analyse his needs and make himself familiar with the available supplies. There is need for a " careers department " or clearing house in connection with the public schools, and the appointment of a " careers master " for each school has great advantages.

A general scheme of training by firms cannot be framed, but it is broadly true that the salesman should have an adequate knowledge of the organisation of his firm and of the commodities and the markets with which he is concerned. This is especially true of the chemical industry, because if the salesman does not know at least as much about his commodity as his prospective customer he is in a position of inferiority in any discussion of the qualities and potentialities of what he has to offer. Every responsible officer of commerce should have a thorough knowledge of the internal organisation of his own firm and of the way in which it carries on its business. Although it will doubtless have activities in which he does not share, he should have a general acquaintance with all of them and a full knowledge of that with which he is particularly concerned. From the nature of the case, the training of the recruit in these matters must be mainly in the business itself, though the school may be able to play some part in it. There is a strong recommendation in the report that the trade organisations should consider their educational needs in connection with the possibility of establishing short intensive courses for employees of suitable experience. We only quote these brief extracts to show the vastness of the field that awaits the leaders of the principal technical organisations within the chemical industry who are now turning their attention to the subject.

The Messel Medallist

THE Society of Chemical Industry has announced that the Messel Medal for 1932 is to be awarded to Sir William J. Pope, Professor of Chemistry at Cambridge University. This medal, which is awarded bi-annually for eminence in applied chemistry, was founded in 1922 as one of the outcomes of the Messel Fund bequeathed to the Society by the late Dr. Rudolph Messel.

Sir William Pope, who was born in 1870, is an old student of Finsbury Technical College, where he studied under Professor H. E. Armstrong, who became the first recipient of the Messel Medal. In 1901 he was appointed professor of chemistry at the Municipal School of Technology, Manchester,

where he remained until 1908, in which year he became professor of chemistry and director of the chemical laboratories at Cambridge. His first researches, in conjunction with Professor Armstrong, concerned sobrerol, a product of the oxidation of turpentine in sunlight. Later he worked with Kipping on the sulphonation of camphor and the sulphonic acids derived from bomo-camphor and chloro-camphor, applying these sulphonic acids to the resolution of a number of racemic compounds. Prior to this time, tartaric acid had been almost the only reagent available for this class of work. It was at Cambridge that he and Barlow published their notable work on the relation between chemical composition and crystalline form, which ultimately led to interesting conceptions of atomic sizes and the close packing of atoms, each atom occupying one, two, three or four units of space according to its valency. Among his other researches he will be best remembered for his discovery of photographic sensitisers, which now enable photographs to be made of objects hidden from the human eye by intervening fog or mist.

Sir William Pope was elected to the Fellowship of the Royal Society in 1902, and received the Davy Medal in 1914. He was president of the Chemical Society, 1917-1919; president of the Society of Chemical Industry, 1920-21, and president of the Union Internationale de la Chimie, 1922-27. During the war he joined the consultant's panel appointed by Lord Fisher's Admiralty Inventions Board.

Tin Restriction Proposals

ACCORDING to *The Financial News* the recent pronouncements concerning meetings of the committees which control the tin producing industry, under the inter-Governmental scheme, have created a bad impression. The affair began with the statement issued by the International Tin Committee after the Paris meeting in March. Out of the morasses of an ambiguity only exampled in Government communiqués that statement said that someone had suggested a cut of one month's production and that the conference had not been able to agree at one sitting. It also stated that the Pool had not considered it necessary to increase its holdings above 21,000 tons, and yet the price of tin has fallen by £30 since the commencement of March. The Paris conference has been followed by meetings of certain members of the committee at the Pool in London, but no official announcement has been made. Suggestions being put forward at the London meetings are considered to be of the highest importance, and appear to be concerned with drastic proposals for strengthening the market on the purely marketing side, including the suggestion of an actual selling combine and further cuts in production quotas. Without some real change in policy it seems clear, as *The Financial News* points out, that all that can be expected to be agreed to by the parties concerned is the suggested cut of one month's production. The possibility of organising a formal tin syndicate similar to that in the case of copper is somewhat fantastic, when the total stocks of tin at present available amount to more than 60,000 tons and consumers of this metal are living from hand to mouth.

Chemical Publicity

MANY of the chemical organisations run their own periodicals for the information of their members on matters of more or less personal concern, but there is no association—excepting the few which deny that publicity has any value whatever—that regards its journal as anything more than a domestic matter. On the one hand we have the association organ and on the other the popular newspaper which has no concern beyond providing the general public with interesting reading. Between the two stands the independent technical journal which serves the interests of the particular industry, unfettered by association with any particular body and designed solely to promote the well-being of the industry as a whole. During the past few weeks we have been investigating the extent to which all the chemical organisations make as much use as they might of THE CHEMICAL AGE, and while it has been a revelation to find how intimate are the relationships between our readers and ourselves, it has been even more surprising to discover that quite a number of bodies, more particularly local sections, have failed to appreciate that whereas they have benefited from the general store of information that reaches them week by week they have neglected the opportunity of contributing to the common pool of knowledge.

Probably many of these smaller organisations regard themselves as too insignificant to be worthy of mention, but they are, after all, units in a great industry which depends for its ultimate prosperity upon the enterprise, research and investigation of each of its parts. We urge them, therefore, to shake off their inferiority complex and to realise that in chemical science and engineering knowledge, as in the sphere of benevolence, it is no less blessed to give than to receive.

Books Received

ALLEN'S COMMERCIAL ORGANIC ANALYSIS. Vol. IX, Fifth edition. Edited by C. Ainsworth Mitchell. London: J. and A. Churchill. Pp. 618. 32s.

BANKING CREDIT AND THE CRISIS. By J. W. Kempster. London: London General Press. Pp. 386. 12s. 6d.

CHEMICAL CALCULATIONS. J. S. Long and H. V. Anderson. London: McGraw-Hill. Pp. 260. 10s. 6d.

EDISON and HIS COMPETITION. A. Horschitz and Paul Oestreich. Translated from the German by Alice Hohenemser-Salt. London: W. and G. Foyle, Ltd. Pp. 84. 3s.

KOLLOIDCHEMIE DER SEIFEN. By Dr. E. L. Lederer. Dresden: Theodor Steinkopff. Pp. 430. Rm 38.

VOLUMETRIC ANALYSIS. By G. Fowles. London: G. Bell and Sons, Ltd. Pp. 202. 6s.

The Calendar

April 18, 25, and May 2.—Royal Society of Arts. "Recent Researches on the Nature and Function of Vitamins." J. C. Drummond. 8 p.m. John Street, Adelphi, London.

April 19.—Society of Glass Technology. Committee and Council meetings and informal dinner. King's Head Hotel, Sheffield.

April 20.—Society of Glass Technology. Annual general meeting. University, Sheffield.

April 21.—Society of Chemical Industry, Nottingham Section. "Recent Improvements in Non-Corrodible Steels for Domestic and Industrial Uses." J. A. Clements. 7.30 p.m. Derby Technical College.

April 21.—Chemical Society. Ordinary scientific meeting. 8 p.m. Burlington House, Piccadilly, London.

April 22.—Chemical Engineering Group. Annual general meeting and dinner. "Currency and Prices." Rt. Hon. Sir Robert Horne. 6.45 p.m. Waldorf Hotel, London.

April 22.—Institute of Fuel (N.W. Section). "Methods employed for the Removal of Dust from Flue Gases, with details of operating progress." J. Mayer. 7 p.m. 17 Albert Square, Manchester.

The Chemical Inventor and Patent Law

By Jervis Roscoe, B.Sc., Barrister-at-Law

AN inventor may, by taking out a patent, protect his invention for sixteen years. During that time only the inventor and persons to whom he grants licences may exercise the invention. An inventor is he who first discovers an invention or first introduces it to this country; an invention must be a manner of new manufacture. A process for making or treating substances or goods has been regarded as a manner of manufacture for which a patent may be granted, and articles made by a process are themselves proper subject-matter for protection by patent. In both cases, however, there must be novelty; the process must be new if the inventor wishes to patent it, and the goods themselves must be novel if they are to be protected.

Generally speaking then, anyone who has found out a new way of making an article, or who has succeeded in making something not before known, can take out a patent either for the process or for the product, or possibly for both. It is not necessary to deal with the procedure on application, all of which can be found in any book dealing with patents for inventions. Appropriate forms have to be filled in and fees are paid and ultimately the inventor receives his monopoly in the form of Letters Patent.

Pitfalls and Difficulties

There are many pitfalls and difficulties which beset the path of any inventor but the position of the chemist who seeks to protect the results of his work by patent is peculiar and is laid down by Section 38 (A) of the Patents and Designs Acts, 1907-1919. This Section, so far as it is material, is as follows:—

> " In the case of inventions relating to substances prepared or produced by chemical processes, the specification shall not include claims for the substance itself, except when prepared or produced by the special methods or processes of manufacture described and claimed or by their obvious chemical equivalents: provided that in an action for infringement of a patent where the invention relates to the production of a new substance, any substance of the same chemical composition and constitution shall, in the absence of proof to the contrary be deemed to have been produced by the patented process."

The general meaning of this section is fairly clear but it is necessary to consider what precisely is meant by such terms as " chemical process," and for this reason it is necessary to consider cases which have been decided in the Courts. In S's Application for a patent which is reported in Reports of Patent Cases (38) at page 399, the patentee claimed " as an article of manufacture, phthalic anhydride being substantially chemically pure and having a melting point above 130° Centrigrade (corrected)." There was no claim for a process. The patent was refused by the Patent Office in view of Section 38 (A) and the patentee appealed. It was argued that the process described for producing the novel substance, which consisted of sublimation and condensation, was a purely physical and not a chemical process. The tribunal decided against that argument and held that the section was not to be read so narrowly and the patent was refused. In R. R.'s Application reported in R.P.C. (42) at page 303 the invention for which a patent was sought related to mineral oils. There were many claims for the various grades of oils produced by a process of fractional distillation but the claims were not limited to any particular process. The Assistant-Comptroller of Patents refused to proceed with the application unless the claims were limited to oils " when prepared or produced by the special methods or processes of manufacture described and claimed." The patentee appealed, but the tribunal decided that fractional distillation of natural mineral oils was a chemical process within the meaning of the Section and the patent was refused.

The Widely-Worded Claim

In H. E. P.'s Application, R.P.C. (43) page 150, the invention related to activated carbons as used for decolourising liquids, absorbing gases and for other purposes. The claims were for the products and were not limited to substances produced by particular methods. The Patent Office refused the patent on the grounds that the specification did not satisfy the requirements of Section 38 (A). The patentee appealed. It was argued that the product claimed had certain physical properties and that it owed its commercial application to its physical structure and that that structure was not produced by any chemical process but that it existed in the raw material. It was urged that all that was done was to remove other matter contained in the raw material and that even if such removal were brought about by a chemical process the resulting product had not been prepared or produced by a chemical process.

The tribunal decided that the substance was produced by a chemical process and the patent was refused. In the course of his judgment the Solicitor-General stated that in his opinion the use of the two words " prepared " and " produced " was intended to have some significance. He suggested that " prepared " connoted the idea of the treatment of a substance already in existence but not in a suitable condition for use, but that " produced " involved the idea of drawing out something which was mixed or confused or incomplete and not readily available for use or handling.

It will be appreciated from the cases that many processes which the chemist might regard as physical are likely to be treated as offending against Section 38 (A) by the legal authorities. It should be noted that a claim which pretends to monopolise a process while really claiming the product will not be allowed. Thus any attempt to word the process claim so widely as to try to cover all possible processes and therefore to monopolise the product will not succeed.

The Question of Infringement

When a patentee alleges that his patent has been infringed the burden of proving infringement rests on the patentee. But by the proviso to Section 38 (A), where the action is for infringement of a patent for producing a new substance, and where the substance of which complaint is made is of the same chemical composition and constitution, then the defendant has to prove that he made his substance by a process different from that claimed by the patentee. The reason for the proviso is that it is usually quite impossible for the patentee to say how the defendant made the substance, and if the substance is identical with that produced by the patented process the patentee is entitled to assume that his monopoly has been infringed. If the defendant has evolved some distinct process for making the same substance he is the proper person to explain to the Court what he has done and the Court will decide whether or not his process is an infringement of the patentee's monopoly.

Except for the distinction referred to an action for infringement of a chemical patent is the same as any other action for infringement of Letters Patent. The plaintiff alleges that the patent is valid and that it has been infringed; the defendant denies infringement and usually alleges that the patent is not valid. So far as non-infringement is concerned two questions arise. The Court first decides what precisely is covered by the patentee's claim and then considers whether or not what the defendant has done falls within the claim. With regard to invalidity the issues are more difficult. The defendant may contend that the patent is invalid because the invention has previously been published either in an earlier patent specification or in a book. The Court must be satisfied that the invention was wholly disclosed by such publication before the Court pronounces the patent invalid. The defendant may affirm that he or others were doing the very thing for which a patent has been granted long before the patentee applied for his monopoly. Such a defence is known technically as a plea of prior public user. If it can be established it is very effective and results in destruction of the monopoly.

Ambiguous or Misleading Statements

There are other defences. The defendant may state that the specification is misleading or ambiguous or not sufficiently explicit to enable the invention to be carried out, or that the result promised by the patentee is not obtained. All these matters are, however, only of importance to those who find themselves involved in a patent action. So far as the chemist is concerned he must remember that when he discovers a new

way of making a substance he can only monopolise that way and similar ways of making such substance and not the substance itself, even though the substance be new. Further, where an owner of a patent relating to a chemical process suspects that a substance is being made by his protected process he can require the suspected wrongdoer to explain how he makes his substance. Finally, it is a cardinal principle of patent law that any man is quite entitled to rest assured that so long as he only continues to do what he has done in the past he is free from attack at the hands of any patentee, and a defence of prior user is, if successful, likely to result in the destruction of the monopoly.

Lubricants and their Relation to Engine Tests

Need for Greater Collaboration between Chemist and Engineer

At the April meeting of the Manchester Section of the Society of Chemical Industry, when Dr. T. Callan presided, Mr. F. J. Slee, of the technical department of Shell-Mex and B.P., Ltd., delivered a lecture on "Laboratory Tests of Lubricants in relation to Engine Tests."

Mr. Slee dealt with the history of the laboratory testing of lubricating oils, the significance of tests, such as specific gravity, flash point, viscosity, and saponifiable matter, and also the selection of lubricants for special purposes. The tests referred to included the question of flash point and carbonisation in an engine, the significance of viscosity curve and lubricating value, and of compounding and wear tests, and suggestions were also made with regard to information still required by the oil world. It was pointed out that a considerable distinction must be drawn between lubricant testing and chemical analysis. By the aid of chemical analysis it was possible to state with certainty the composition and constitution of certain materials. In the case of lubricants, however, this was not possible, for the ultimate analysis of a lubricant was of little value.

Limitations of the Specification

Mr. Slee was of the opinion that there had been a certain element of error in regard to the testing of oils. He considered that a specification should be framed by the chemist, in collaboration with the engineer, in order to ensure that the engineer was regularly receiving a lubricant which he had already proved (by engine tests) to be satisfactory. He did not think that a specification should go any further than that. Unfortunately, specifications had been carried further. The chemist commenced to read into his particular laboratory tests an engine interpretation which did not exist. Even to-day, if many people were asked what effect the flash point had on the carbonisation of oil in an internal combustion engine they would say that, obviously, the higher the flash point the less the amount of carbon deposited in the engine. As a matter of fact, it was often the other way round. In the majority of cases the lower the flash point the less the amount of carbon, within certain limits, which would be deposited in an internal combustion engine. Therefore, it was found that the chemist read into his specification engine results which were not actual facts. This state of things had retarded lubrication progress to a considerable extent, and collaboration between the chemist and the engineer became urgently necessary.

The Principal Physical Tests

Taken in conjunction with other tests, the specific gravity disclosed the origin of a lubricating oil, but it had been generally agreed for some time that specific gravity gave no indication of the value of an oil as a lubricant, and had only been considered necessary in certain special oils such as turbine oils and steam cylinder oils. It was only necessary to quote laboratory oxidation and turbine running tests to show that specific gravity was no longer a criterion of lubricating value in turbine lubrication, and that even in steam cylinder lubrication it could be omitted as being a test showing the lubricating value of an oil, but was included solely to show the origin of the cylinder oil. The flash point was merely a convenient method of measuring its vapour pressure, and engine tests could be quoted to show that engine carbonisation results could not in any way be correlated with the flash point of a lubricant. Coming to the question of viscosity, this was a selective test by which it was primarily possible to judge the suitability of a lubricant for a particular purpose. The object of lubrication was to replace solid friction by fluid friction, and the correct lubricant to use was the lowest viscosity oil which would maintain a film under given arduous conditions and at the same time provide a sufficient factor of safety.

For ordinary bearing and axle lubrication the right way to frame a viscosity specification was to get the engineer to ascertain the correct viscosity oil which would give him a film at his highest running temperature. He should then specify the highest setting point permissible in the circumstances. Viscosities between the highest running temperature and the setting point were unnecessary and axle running tests were given in support of this contention. The viscosity curve was somewhat related to the question of carbonisation in internal combustion engines and engine tests were given showing this. The more filtered residual oil put in an oil, the flatter would be the curve and the higher the carbonisation.

The Compounding of Steam Cylinder Oils

The question of compounding had been fully dealt with by Marshall and Barton from the point of view of piston friction and bearing wear. In some cases, compounding was invaluable. Fatty oils exerted a decided solvent action upon products of bad combustion and on tars. Steam cylinder oil compounding was often of the greatest possible value. A steam cylinder oil was fed, by injection, into the steam before the steam passed into the valve chest and was then led into the engine. If the oil atomised thoroughly in the steam, and was deposited as an even coating over the valves and the cylinders, then satisfactory lubrication would result, but if the oil was taken in in "blobs," there would be uneven lubrication and "shuddering." He had yet to learn of a case where valves were "chattering" and cylinders "groaning" which could not be remedied by the addition of fatty oil to the cylinder oil, providing the mechanical conditions were satisfactory and the cylinder oil of good quality. The solvent action of the fatty matter on the hard asphalt present in dark cylinder oils improved the atomisability of the lubricant. It was now generally accepted that the suitability of steam cylinder oil as a lubricant for all purposes was largely governed by what was termed "atomisability," but there was no laboratory test for measuring that factor.

Galvanised Wire Standards

A New Specification

The method adopted for testing galvanised wires by dipping samples in a solution of copper sulphate is so well known that it would hardly appear necessary at first sight to issue a standard specification on the subject. It is found in practice, however, that although the general principles of the test are almost universally accepted, individual manufacturers and inspectors often introduce slight variations in the testing routine which, though apparently unimportant, have a substantial effect on the result of the test. The British Standards Institution has therefore co-ordinated all descriptions of this test as given in various specifications and has published Specification No. 443 entitled "The Testing of the Zinc Coating on Galvanised Wires." This new specification states concisely the exact procedure to be followed in the preparation of the samples, the preparation of the copper sulphate solution, and the number and duration of dips in the solution, the latter being graded in accordance with the diameter of the wire. Research work with a view to finding a test which has a definite relation to practical service conditions or provides an absolute comparison between various processes of galvanising, is at present in hand. Copies of Specification No. 443 (1932) may be obtained from the Publications Dept., British Standards Institution, 28 Victoria Street, S.W.1., price 2s. 2d. post free.

The Common Black Pigments

Their Properties in Relation to Corrosion Problems

Comparative studies of black oxide of iron, aniline black, and a number of the more common varieties of carbon itself, have recently been carried out by Professor H. Wagner and Dr. M. Zipfel, and are described at length in "Farben-Zeitung" of March 19, 26, and April 2.

AMONG the range of black pigments studied peculiar interest is centred in black oxide of iron because it forms a soap with the linoleic acid present in linseed oil. Its behaviour is therefore very different from that of red oxide of iron which has no chemical significance in relation to linoleic acid except, possibly, as an oxygen carrier. This discovery of the greater chemical reactivity of divalent iron in contact with linseed oil fatty acids may ultimately prove to be of great practical value, for although manganese dioxide also forms a soap with linoleic acid, this soap differs from the corresponding iron soap in being easily hydrolysed. The resistance of the former to hydrolysis is important from the standpoint of durability, since films of linseed oil pigmented with black oxide of iron undergo a comparatively small degree of swelling in contact with water.

Acceleration of Drying Time

Black oxide of iron accelerates the drying of linseed oil to a remarkable degree. Compared with an original linseed oil drying period of 91 hours, pigmentation with black oxide of iron brought about a reduction of 53 to 69 hours, the other end of the scale being represented by American gas black with a prolongation of drying time of as much as 179 to 509 hours. From a comparison of typical varieties of carbon black, it became clear that the extent of drying retardation was closely related to the carbon content. Bone black, in fact, with its high content of calcium phosphate, actually speeded up the rate of drying in some case, and the same applied to shale black. The influence of graphite on linseed oil drying was intermediate between that of black oxide or iron and lampblack. The apparent anomaly of this very pure form of carbon (98-99 per cent.) differing so markedly from lampblack, finds some explanation in the much higher oil absorption of the latter. Typical oil absorption values (*i.e.*, grams of linseed oil required to form a fluid mixture with 100 grams of pigment) are:—Black oxide of iron, 60; bone black, 90 to 170; shale black, 125; German lampblack, 350 to 520; American lampblack, 510 to 580; graphite, 125 to 140. The two latter types of carbon are thus markedly different in oil absorptive power.

Aniline black exhibits a paradoxical feature in that, with an enormously higher oil absorption (260) than black oxide or iron, it nevertheless exerts almost the same influence on the drying time of linseed oil.

Comparative drying tests on sheet iron and glass gave shorter periods on the former, the reduction being most conspicuous in the case of notorious retarders such as German and American lampblacks. Whereas black oxide of iron resulted in linseed oil drying on glass in 22-38 hours, these periods being reduced to 18 to 28 and 19 to 30 hours on unprimed and nitro-cellulose-primed sheet iron respectively, the corresponding figures for American lampblack were 270 to 600, 73 to 120, and 122 to 184. An examination was also made of the important property of wetting-power (which is defined as the number of grams of pigment which become wetted by 1 gram of oil, or water, in one minute) and co-ordinated with the settling power. German lampblack is only wetted by water with great difficulty, whereas the American variety is wetted out with the greatest ease and settles out with corresponding rapidity. Wetting-out experiments employing benzol also revealed this marked distinction between the properties of German and American lampblacks.

Resistance to Water Absorption

The resistance of black oxide of iron-pigmented linseed oil to swelling as a result of water absorption is not shared to any great extent by pure carbon pigments. Some figures of percentage water absorption for different pigmented well-hardened films of linseed oil on sheet iron were:—Black oxide of iron, 27 to 48 per cent.; bone black, 36 to 98 per cent.; pure Ceylon graphite, 155 per cent.; American lampblack, 130 to 165 per cent. As might reasonably have been expected from this data, the best adhesion to the metal after prolonged immersion in water was shown by the first and second in the list, the lampblack-pigmented film naturally showing up very badly in this respect. A remarkably close parallelism was revealed on the whole, between swelling power in water, oil absorption, drying time, and degree of rusting of the iron surface. The disappointing behaviour of pure carbon is here bound up with such fundamental factors as degree of orientation and dispersivity.

The superior resistance of black oxide of iron to water absorption is well illustrated in the case of water paints in tubes of lead or iron. Corrosion of the tubes is a common occurrence when water paints are pigmented with carbon, the inner surface of the tube becoming completely covered with metal sponge. This is even observed in the absence of acid, but can be avoided by the use of a completely electrolyte-free pigment in distilled water, an indication that electrical processes are at work. The high content of electrolyte in bone black and mineral black has been shown to be directly associated with very severe corrosion in tubes, while even the small traces of electrolytes in lampblack are capable of causing damage. Yet neither black oxide of iron nor graphite induce corrosion. One may assume that part of the metal of which the tube is composed goes into solution and is then reduced to the spongy form. The absorptive power of amorphous carbon is closely bound up with this phenomenon; cathodic hydrogen developed on the carbon particles in the element lead electrolyte lampblack accumulates in active atomic form as in the case of spongy platinum and brings about energetic reduction of lead to lead sponge. In graphite, on the other hand, the non-absorbent nature of the crystal surfaces permits of a rapid transformation of atomic hydrogen to the inactive molecular form.

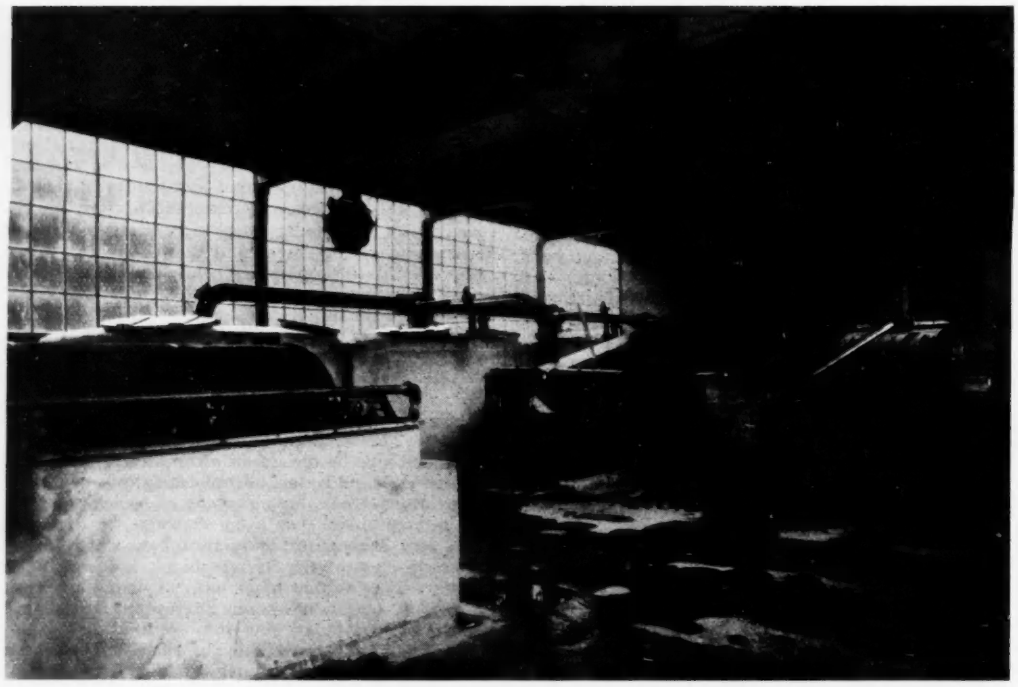
Resistance of Electro-Chemical Corrosion

The above changes apply to some extent in the case of an iron surface coated with carbon-pigmented linseed oil which has absorbed water to form the element iron electrolyte carbon. Iron would be anodically dissolved and the solution reduced to finely divided iron which water and oxygen would convert into rust. The high absorptive power of carbon in the form of lampblack would further this process to a very considerable extent, graphite would be much less energetic in this respect, and the bone blacks of low carbon content, still less so. The anti-corrosive properties of a black pigment therefore appear, in the last resort, to be dependent upon the carbon content. The actual order of resistance to "electro-chemical" corrosion is:—Black oxide of iron, graphite, lampblack, bone and mineral black. From the standpoint of general anti-rusting properties, the order is rather different, being:—Black oxide of iron, bone black, mineral black, graphite, lignite black, German lampblack and American lampblack.

The outstanding conclusions derived from these investigations are that (1) not only does black oxide of iron not favour corrosion of iron but it may even be endowed with anti-corrosive properties; (2) lampblack and graphite encourage corrosion, but whereas amorphous carbon will tend to behave in this way in any binding medium, the electro-chemical properties of graphite would enable it to act as a rust-inhibitor in a suitable, non-swelling medium. Including manganese dioxide among them, the black pigments can be broadly classified into two groups:—

(I.) Accelerators of linseed oil drying, which comprises (a) those with increased swelling due to formation of hydrolysable soaps (manganese), and (b) those with reduced swelling as a result of formation of non-hydrolysable soaps (divalent iron).

(II.) Pigments which retard the drying and increase the swelling of linseed oil, *e.g.*, carbon pigments, the effect being intensified by an increasing degree of amorphousness.

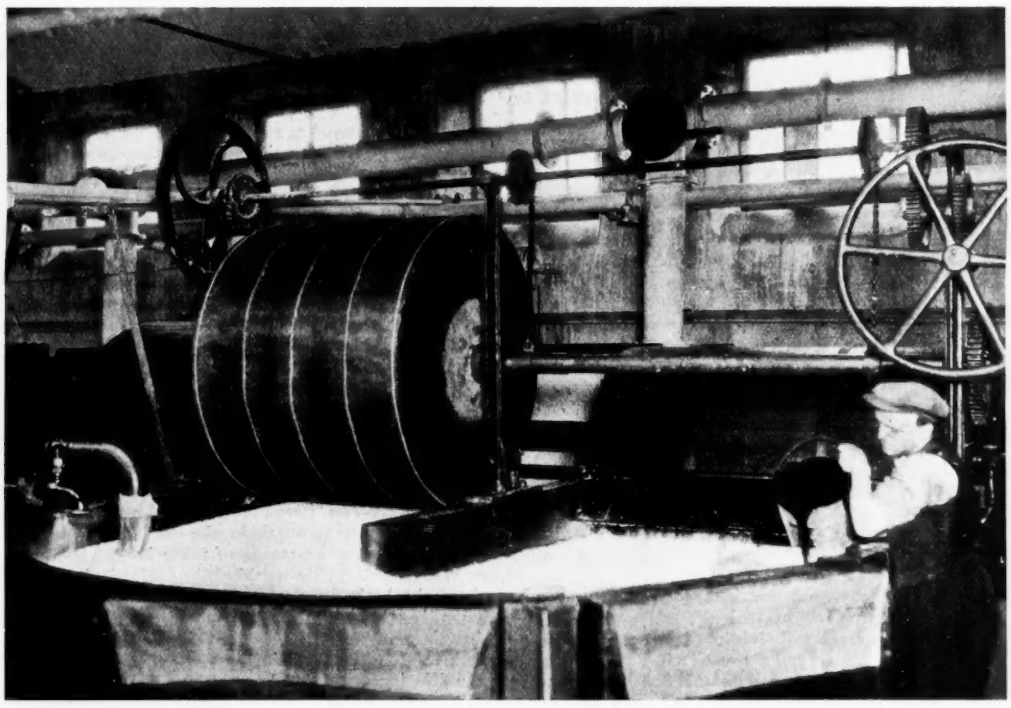


The Breaker, Towers and Washers. Here the pulp is bleached by the aid of bleach liquor and the bleached pulp is subsequently washed.

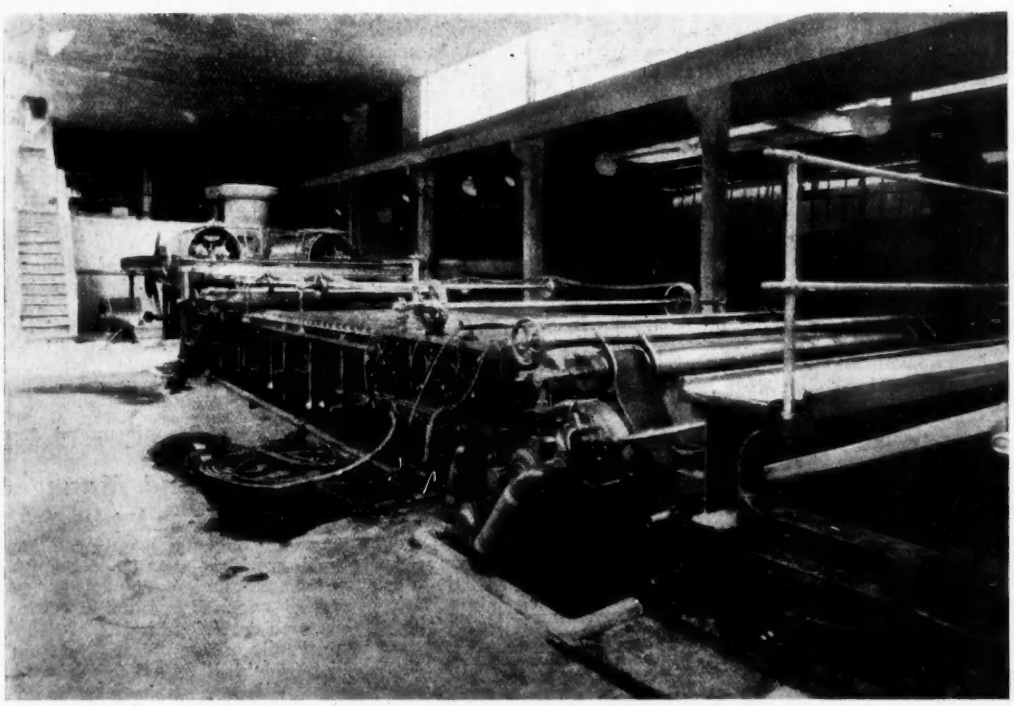
A Battery of Beating Engines. It is at this stage that sizing agents, loading materials (China clay, etc.), and dyestuffs are added to the pulp.

The Chemical Aspect of a Modern Paper Mill

(Reproduced by courtesy of Alex. Pirie and Sons Ltd., Stoneywood Mills, Bucksburn, Aberdeenshire)



A close-up view of one of the Beaters, showing the operation of adding the dyestuff.



The wet end of the Paper-making Machine, where beaten pulp is formed on the wire.

The Chemical Aspect of a Modern Paper Mill

(Reproduced by courtesy of Alex. Pirie and Sons, Ltd., Stoneywood Mills, Bucksburn, Aberdeenshire)

Letters to the Editor

The Editor welcomes expressions of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE *unless its authorship is revealed to the Editor.*

Corrosion-Resisting Materials

To the Editor of THE CHEMICAL AGE.

SIR,—My letter which you published in your issue of March 12 has apparently been taken very much to heart by the suppliers of homogeneous lead linings, judging from the replies which have appeared in print. It is, however, interesting to notice that one of your correspondents agrees with the complaint which I have raised regarding the ineffective adherence of the lead to the steel. Some samples which had been submitted to me most certainly did not need any great efforts to remove the lead, but it is, of course, unwise to base any adverse conclusions upon the inspection of samples, inasmuch as some manufacturers' claims certainly seem to be justified. I have seen linings which require the aid of a chisel to cut the lead from the steel; also linings which only need to be twisted in a vice in order to accomplish this. It is interesting, too, to learn that there are manufacturers who use fluxes which affect the purity of the lead and thereby give rise to conditions favouring corrosion. Can chemically-pure lead be permanently and satisfactorily keyed to smooth steel plate without the use of a flux?

Another one of your correspondents cites an outstanding instance of bad Continental work, which is alleged to have shown defects in each vessel only eight or nine days after being placed in service. Surely the Continental work (some of which has half-a-century of experience behind it!) was not as bad as that. Was it not really a case of the vessels in question being exposed to very exacting conditions where unforeseen contingencies were liable to arise?

In regard to acid-proof stoneware I am much surprised to find that the English *manufacturers* have remained silent. One well-known chemical engineering firm has certainly taken up this point, but it has merely offered me stoneware of Continental make, with which I am already familiar. If I can obtain English stoneware I prefer to have it, provided that the quality is satisfactory, for if I place an order on the Continent, delivery dates are never adhered to, whereas an order given to one of the English stoneware manufacturers is executed more or less at the promised date of delivery, and this is sometimes a factor of no insignificant importance where the manufacture of a new product is being taken in hand. On the one hand, you get good quality; on the other, good delivery. What the user needs is a reasonable combination of these two things.—Yours faithfully,

"CHEMICAL MANUFACTURER."

[This letter was received prior to that from The British Chemical Plant Manufacturers' Association, which we print below and which now answers our correspondent in regard to chemical stoneware.—Ed.—"C.A."]

To the Editor of THE CHEMICAL AGE.

SIR,—When "Chemical Manufacturer's" letter appeared in your columns a few weeks ago, I suggested to the members of this Association, who specialise in lead-lined plant, that they should reply to the sweeping criticisms directed against British-made plant. This they have done in your columns, and their letters speak for themselves. "Chemical Manufacturer" has apparently been unfortunate in his choice of firms.

As regards chemical stoneware, I have been in communication with the main suppliers in this country who, so far, are not members of this Association. One of them makes the following observations:—

"The criticisms of British chemical stoneware are somewhat sweeping and general in their application. We agree that an impervious body is the first essential of chemical stoneware, but we do not think there is anything to choose between salt glaze, and an applied glaze. So far as we are concerned, we are of opinion that our present body has justified itself, having regard to the very large quantities which are in constant use, both in this country and abroad, and concerning which we have experienced no sort of general complaint. It is obvious that manufacturers of chemical stoneware are not always fully informed as to the purpose and the conditions under which their ware will be employed, and there must necessarily be instances in which ware is called upon to withstand extreme and sudden variations of temperature which will not be tolerated by any stoneware material. We are very conscious that although our present bodies are good, there is always room for improvement, and constant research work is in progress to that end. At the present time we are carrying out experiments with a modified stoneware body, which we have reason to hope will present a definite advance in acid-resisting characteristics, and as soon as our experiments are complete we shall be in a position to furnish samples to potential users."

Two points of importance emerge from this correspondence. In the first place, difficulties arise because in too many cases the British chemical plant maker is not given full information regarding the conditions for which the plant is required; consequently he has to work in the dark and is unable to satisfy himself as to the best type of material for the particular purpose in view. This withholding of vital data thus reacts adversely both on the maker and the user of the plant. Secondly, there is a pressing need for the closer co-operation of maker and user in the development of corrosion-resisting materials. My Association was formed some ten years ago in affiliation with the Association of British Chemical Manufacturers, with the definite object of securing co-operation between makers and users of chemical plant, and there has been in existence for several years a joint committee of the two Associations engaged on problems relating to corrosion-resisting materials for plant construction.

"Chemical Manufacturer" is apparently not a member of the Association of British Chemical Manufacturers, otherwise he would no doubt have taken advantage of the invitation extended to members a few months ago to suggest problems requiring further investigation in regard to plant constructional materials, by drawing attention to the two cases which he now mentions. Nevertheless, his letter has served a useful purpose and has indicated directions in which further co-operative work may usefully be done. It is hoped that he will be willing to place his experience at the disposal of the joint committee of the Association of British Chemical Manufacturers and the British Chemical Plant Manufacturers' Association which deals with these problems. With the complete co-operation of makers and users, there is no reason why the few remaining causes of complaint in regard to British chemical plant should not be speedily and entirely removed to the benefit of all concerned.—Yours faithfully,

J. DAVIDSON PRATT,
Secretary,
British Chemical Plant Manufacturers' Association.
166 Piccadilly, W.1.

Business Research and Management

To the Editor of THE CHEMICAL AGE.

SIR,—One of your correspondents recently mentioned in your columns the valuable work that was being done for industry by the Business Research and Management Association of Great Britain. As I received a number of inquiries for further particulars as a result of his letter, I am persuaded to send you some details of our objects, as I am sure that many other readers would like to know of our activities. The chemical industry is one of the most progressive and quick to adopt the most modern methods.

The Association was formed some seven years ago with the sole intention of stimulating the knowledge of and need for market investigation. Our present chairman, Mr. A. G. H. Dent, F.S.S., of the Standard Telephone and Cable Co., realised, however, that there was a need for research into other aspects of industry quite apart from the purely technical research, and that valuable work could be per-

formed by spreading the knowledge of modern methods of management control, and providing a central meeting place for executives of all ranks regardless of their profession, where they could exchange experiences and discuss common problems.

The value of this development is strikingly evidenced by the rapid growth which has resulted during the past two years, and the fact that our members now consist of executives from chairmen to students. In view of the many problems with which such executives are faced, the subjects of our meetings must be diverse and they range from questions of finance to sales and problems of trade forecasting to personnel management.

The chief activity of the Association is the holding of monthly meetings at Andertons Hotel, Fleet Street, at which papers are presented by prominent experts, and discussions on various points arising from the address are encouraged. The speeches are reprinted and supplied to members as a permanent reference. The quality of the speakers and the value of the papers is evidenced by the fact that they receive a wide press. These meetings are open to friends of members, while there is limited accommodation for other interested persons. Membership is open to individuals (men or women) while a special membership obtains for firms, whereby any of the executives can attend the meetings, an obvious advantage when the diversity of the subjects covered is realised. The Association is the only one of its kind in this country that is dealing with modern methods of management and appealing to individual executives regardless of their rank or occupation. The advantage is that it enables valuable experience in one industry to be made available for executives in other realms of industry.

The president is Sir Henry Bunbery, K.C.B., and the vice-presidents include Sir Francis Goodenough, Sir William Crawford, Mr. J. A. Crabtree and Professor J. H. Jones. I shall be glad to supply any further information, or send a copy of the programme to those interested in the movement.—Yours faithfully,

H. A. HAYLETT.
Hon. Secretary.

Business Research and Management Association of Great Britain.
c/o The Basil Butler Co., Ltd.,
5 Quality Court,
Chancery Lane, W.C.2.

Difficulties of the Inventor

To the Editor of THE CHEMICAL AGE.

SIR,—One of the principal difficulties confronting the inventor is ascertaining what inventions and improvements are required. The Council of the Institute of Patentees is therefore publishing a third edition of a book entitled "What's Wanted" and I am instructed to seek the co-operation of your readers. It is not always possible to give a definite invention needed, but it is possible to give a guiding line.

Every suggestion received will be referenced and should your readers require it, solutions can be submitted to them. Under no circumstance will their names be sent out without permission. Any assistance or suggestion will be greatly appreciated.—Yours faithfully,

G. DRURY COLEMAN,
General Secretary, Institute of Patentees.
39 Victoria Street,
Westminster, S.W.1.

Indian Chemical Notes

[FROM OUR INDIAN CORRESPONDENT.]

THE Mysore Government is seriously considering methods of marketing chromite ore outside India, the quality of Mysore chromite being equal to that produced elsewhere. It is stated that railway freights will make competition difficult. The Director of Geology in the State is being asked to investigate the matter and to suggest methods of marketing the ore abroad under Government control with the necessary facilities of transport, etc. Meanwhile experiments have been in progress in the manufacture of ferro-chrome, first with a single phase arc furnace and subsequently with a three phase arc furnace, and the results so far are said to be encouraging.

Forest Products Research

The Report of the Forest Research Institute at Dehra Dun shows further progress in research under all sections. In the matter of wood preservation, a method has been developed by which it is possible to impregnate the wood of spruce and fir with preservative without the necessity of first incising the sleepers. In the Wood Workshops section, a study of glues and their application to plywood manufacture in India has been undertaken. Work under Timber Testing Section is making good progress and it is stated that it should be possible within a few years to oust imported woods from India by the substitute of Indian woods which have come into little use hitherto, but whose strengths will now be determined

Revised Salt Rules

The Government of India have revised their salt rules and this revision is of special significance to salt producers in Bihar where earth salt can be made. The licence fee for licence to refine saltpetre for Bihar has been fixed at Rs.20 while the same is Rs.50 in U.P. This change of policy of the Central Government should encourage salt manufacture and that also of saltpetre in Bihar. It is stated that small manufacturers of salt will get more advantage in their own locality. Their salt would be consumed locally and thereby they will derive a good margin of profit as against rail-borne or sea-borne salt for which heavy freight would be paid.

Drug Trade Operations

The disturbed political situation in India has made business very difficult. It is true that piecegoods are the main things affected, but as the general feeling is against everything British, even the chemical trade is affected to some extent. At present there is some preference shown towards American and German products just with a view to teach England a lesson that she can no more hope of governing India without the consent of the people. Meanwhile, the Indian manufacturers of drugs, etc., are extending their operations to take advantage of the new impetus to Indian business. It does not seem, however, that there will be any very real effect on the chemical trade.

Mysore's Steel Experiments

Experiments were for some time in progress at the Bhadravati Iron Works, Mysore State, for the manufacture of good steel, and considering the availability of the supply of fuel which is there (wood or coal) the Bessemer and electric processes were principally investigated. The steel ingots obtained have been well reported upon by the Eagle Rolling Mills, of Kumardhubi. It is stated that the metal is easily worked and should form an ideal material for general smithy work. The welded bars have been cut in the centre of the weld and it is interesting to note that no sign of the hand welding is visible. Based on these results of the experiments, a scheme is now under consideration for the manufacture of steel at Bhadravati, to the annual output of about 12,000 tons of finished products.

Society of Public Analysts

New Members Elected

MR. F. W. F. ARNAUD presided at an ordinary meeting of the Society of Public Analysts, held at the Chemical Society's Rooms, Burlington House, on April 6. Certificates were read for the first time in favour of R. H. Hopkins and W. B. Walker, and for the second time in favour of E. B. Anderson, E. F. Eaton, F. Maudsley, J. W. Thom and S. G. Stevenson.

The following were elected members of the society:—A. A. D. Comrie, E. W. S. Press and Muriel Roberts.

The following papers were read and discussed:—"The Estimation of Hormones," by K. Culhane and S. W. F. Underhill; "The Chemical Assay of Thyroid Gland," by G. Middleton; "The Water-Protein Ratio of Lean Meat, and its Bearing upon the Analysis of Sausages," by F. W. Jackson and Osman Jones; "Nitrite in Cured Meats," by Osman Jones, and "Notes on the Freezing Point of Milk," by H. C. Lockwood.

Brighter Future for British Chemical Industry

Sir Harry McGowan's Guarded Optimism at Imperial Chemical Industries Annual Meeting

Sanguine hopes for the Ottawa Conference were expressed by Sir Harry McGowan in his address as chairman at the annual general meeting of Imperial Chemical Industries, Ltd., held at the Central Hall, Westminster, on Thursday, April 14. Sir Harry expressed the view that the outcome of the company's year's trading had exceeded expectations.

SIR HARRY MCGOWAN, in moving the adoption of the report and accounts, said the abandonment of the gold standard marked, in his opinion, the removal of the special handicap under which British industry had laboured since 1925. Having reviewed the accounts and balance sheet (which have already been summarised in THE CHEMICAL AGE), and described the steps taken during the year towards greater efficiency in rationalising production and finance and in effecting economies of the most rigorous character, he expressed his gratification that the fiscal policy of this country had been changed. The lines upon which the Government had proceeded appeared to have been dictated by wisdom and caution. Convinced for some time that the adoption of a tariff by this country was inevitable, the directors had associated themselves with a careful investigation of the effect of that policy upon the chemical and other trades in which they were active. They were, therefore, able to place before the Advisory Committee constituted under the Import Duties Act carefully considered and well documented views. Many difficulties would have to be surmounted, and there would inevitably be some temporary uncertainty touching the readjustments of trade which would follow. In two respects the company was in an advantageous position. First, the major part of its raw materials was produced at home. Many of them, indeed, they made or owned themselves. So far, therefore, as increases in price followed the application of the tariff, they would be but little effected. Secondly, retaliatory duties by other countries should not much affect them because a large proportion of their export market lay in countries which were not as yet industrially developed. The company had, he believed, few disadvantages and many advantages to gain from this historic fiscal change.

Large Scale Business

Imperial Chemical Industries was to-day regarded in many countries as the British prototype of large scale business. Recently doubts had been expressed of the soundness and permanence of very large concerns, especially when their ramifications had a world-wide scope. As was not unusual, these doubts sprang from a few striking cases of failure. They rested upon the reasoning that what had proved true in two or three cases must be true in general. This was an elementary fallacy. Specific failures did not affect the validity of a principle. Organisation to-day was not only a power but a necessity. The I.C.I. organisation had been built upon firm foundations and was as free as it could be made from the defects which in other cases had led to trouble. Its method of control ensured harmonious working and co-ordinated direction over the whole wide field of its activities. Group or company inter-competition was avoided, there was no conflict of authority, and wasteful duplication was eliminated. Each group had a subordinate board, which was in reality the group executive, consisting entirely of members of the staff, some attached to the companies within the group, and the remainder to head office; none of the directors acted in this capacity. All technical, commercial, financial and administrative problems concerning one group were therefore studied in the first place, as affecting one entity, although in putting decisions into effect they naturally complied with any obligations arising out of the separate legal existence of each company. The company's ideal was a thoroughly dovetailed executive staff, well-balanced, self-supporting, with a clearly defined policy, so that its full power should not be impaired or even shaken by the loss of any one individual.

Financial Rationalisation

Speaking of rationalisation, Sir Harry said they were working towards the day when the number of subsidiary companies in this country would be much reduced. This end could only be achieved gradually. The registration the other day of I.C.I. (Explosives), Ltd., was one move in this direction. But already they had been able, through the concentration of manufacture and other means, to dispense with a number of companies. They had been liquidated, after transferring their assets and their business to another company in the group. This explanation was desirable because the liquidation of a company may give rise to misapprehension. Only too often companies were put into liquidation because they were failures, because of continuous losses and exhausted resources. People were apt to think that the liquidation of an I.C.I. company was due to the same cause, and he wanted to make it clear that this was not so. Liquidation in the case of any of their subsidiary companies represented not a tale of disaster, but a step in the work of financial rationalisation. In the future there would be more of these liquidations. Progress would not be rapid. They would not let any company pass out of existence until they were satisfied that they had preserved the goodwill of its name. In some cases it would be necessary to consolidate into one security long standing separate debenture issues of subsidiary companies. A constant difficulty also arose from the perplexities of taxation, which often imposed financial burdens on what was economically and industrially desirable.

Every class of expenditure had been subjected to careful scrutiny by reference to the purpose it was designed to serve, and all outlays which had been judged insufficiently remunerative or promising had been eliminated. They had made these reductions with great regret, but they were an essential element in sharpening their competitive power without which they would not have been able to retain all those who were still with them. The increase of efficiency was a condition precedent to the restoration to employment of displaced workers of all descriptions.

New Products

The fruits of a policy of rationalised production and research were to be found in their new products. They were now manufacturing some 50 dyestuffs hitherto not made in this country, and had improved the quality of many others. Research in the dyestuffs laboratories had also been applied to rubber accelerators, anti-oxidants, softeners, etc. They had successfully co-operated with other concerns in the search for a British-made celluloid for safety glass. Rapid progress was also taking place in Dulux "new process" paints and varnishes, which could be used when nitro-cellulose was not suitable. The range of low freezing blasting explosives had been extended by the introduction of more powerful compositions. Special types of black powder, one for slate blasting and one for use in tropical climates, had also been developed. Improvements had been effected in rifle ammunition of the high velocity type which had greatly increased accuracy in long-range target competitions. This had also materially improved their competitive position. They had placed on the market a solid carbon dioxide refrigerant, developed at Billingham, and sold under the name of Drikold. It would, they believed, play a large part in enabling perishable foodstuffs to be marketed in perfect condition. It had, in addition, other important industrial applications. To develop their mineral resources at Billingham, a range of new building materials based on anhydrite was now being placed on the market. The production at Billingham of general chemicals, to which he referred last year, *e.g.*, concentrated compound fertilisers, methanol, nitric acid, acetic acid, etc., had shown substantial progress during 1931.

International Agreements

In some respects the purposes of tariffs and international agreements were in conflict. Unassisted as they had been in the past by tariffs, they had been convinced believers in the long-range wisdom of international agreements as instruments of world rationalisation of industry. Co-operation, they had always found, was better in the long run than competitive warfare. In pursuance of this policy, they had recently concluded an agreement, following protracted nego-

tiations, with the Continental manufacturers of dyestuffs. For some years arrangements had existed between French, German and Swiss makers under which they co-operated with one another and marketed their products in an orderly manner. He was inclined to think that for some time the British dye industry was regarded as not having proved its permanence. Since 1927, when the industry was brought within the ambit of their merger, no effort had been spared to increase its competitive power, to extend the variety of its products, to introduce new and improved dyestuffs, and to develop a service to the dyestuffs user which should meet his every requirement. In these matters they claimed to have been remarkably successful. Financial results had not been allowed to interfere with their efforts, and during this process of improvement, the monetary results of their operations had not been economic. But the position has slowly grown better, and to-day they were satisfied with the virility of this industry. Their international position had been greatly strengthened by the agreement in question. It would not diminish their normal incentive to improve existing products or to widen their range by new inventions. Research and development would proceed as hitherto. It would still permit of colour-users obtaining from Continental makers dyes not produced in this country. At home, they had taken a correlative step by acquiring the British Alizarine Co., Ltd.

Nitrogen Agreement

They also participated in another international agreement which, unfortunately, was of but short duration. The International Nitrogen Convention, in which numerous European manufacturers of synthetic nitrogen joined, between which and the Chilean producers of natural nitrate of soda there were marketing and financial relations, was admittedly of a temporary nature pending, it was hoped, the conclusion of a lasting agreement. During its short life, the Convention did much to assist in orderly marketing, apart from its substantial contribution towards regulating production to consumption. Negotiations last summer for the continuance of the Convention unfortunately broke down. The close co-operation which the company had already established with the German synthetic nitrogen producers had not been affected. During the period of unrestricted competition through which the nitrogen industry was now passing, these arrangements were of material assistance to each party. They both stood ready to consider and to take an active part in bringing into operation any equitable scheme for restoring order in the world's nitrogen industry, which, while still satisfying national aspirations, would enable plants to be run on a stable international basis, and fertilisers to be sold at a price holding a fair balance between producer and consumer. In foreign markets the outlook for fertilisers was obscure. Only as agricultural conditions improved could any substantial revival of demand be expected. At home the picture was more encouraging. The nation was now appreciating that an increase in home food production was a pressing problem.

International Hydrogenation Patents

The year saw the successful conclusion of an agreement between I. G. Farbenindustrie, Royal Dutch Shell, Standard Oil Company of New Jersey and their own company to form the International Hydrogenation Patents Co. This agreement was ratified in April, 1931, and its effect had been to increase materially the progress in research work on this important problem. All patent difficulties had been eliminated. The pooling of information and complete exchange of operating experience had produced a great improvement in the process for production of petrol from coal and liquid coal products, and had also enabled them to test British coals on plants alternative in design to their own. The full scale development of synthetic petrol would come in due time, stimulated by the national advantages which would arise from the establishment of the industry—strategic security, reduction of unemployment, relief to the national balance of payments, benefit to the coal mining industry, etc.

The founding companies of I.C.I. recognised years ago the necessity of co-operating with those interested in the same manufactures in the self-governing British communities overseas. The ideas to be developed at the forthcoming conference at Ottawa had long animated their actions, so that to-day in their industry most of the practical ends had already been achieved. In Australasia, through Imperial Chemical Industries of Australia and New Zealand, Ltd., in Canada through Canadian Industries, Ltd., in South Africa through African Explosives and Industries, Ltd., each with factories on the spot, the company possessed interests shared partly with other leading industrial concerns, which sought the fullest co-operation between industry and capital in the mother country and the daughter nations. This imperial work had met with the sympathy of the respective Governments, and on this practical experience he founded sanguine hopes of the coming deliberations between imperial statesman at Ottawa. They must lead, but it was industry which must follow. And British industry could not bring ideals to fruition in practical achievements unless it was organised. For these reasons we welcomed the announcement that the British Government was favourably disposed to the proposal that business advisers should be attached to the United Kingdom Delegation. They would be glad to place at the disposal of the Government any help which could be drawn from their own experience.

The Outlook for 1932 and the Future

Sir Harry continued: To assume the role of a prophet is at all times dangerous. In present world conditions it would be foolish. At home, the outlook in my view is brighter than it has been for some time. We have regained our monetary freedom so that industry has its future much more in its own hands. In addition, behind the security of a tariff, industries which have not yet been able to re-organise themselves upon modern lines or to talk with their international competitors upon even terms, will be able to face the future with renewed confidence. The sales of our own products at home are so intimately tied to the prosperity of the principal industries of the country that everything which enables them to better their conditions should, at the same time, improve our own. So far as the evidence of the early months is available, it all goes to show that British industry is becoming more active. That fact is of hopeful augury for the year as a whole. The economies we have been able to make in our own organisation are another encouraging factor. We are firmly determined, however much trade may develop, not to lose a single one of the advantages gained in this direction, not to let ourselves be lured into any expenditure which can be avoided, not to forgo a single item of the improved efficiencies we have been able to introduce. When confidence returns and trade begins to expand, no organisation will prove to be better equipped than our own to grasp every opportunity.

Unless some collapse not at present within common contemplation should descend upon the world, the results of our trading for the current year should be at least as good as they were last year. Indeed, if we may take the first three months of 1932 as an index, there is every probability that they will be better, but the measure of increase, if it should accrue, must be left to events to determine.

Cane Sugar as a Raw Material

Industrial Possibilities

INTENSIVE study is now being made of cane sugar as an industrial raw material. Drs. Gerald J. Cox and John Metschl, of the Mellon Institute of Industrial Research, Pittsburgh, reported the progress of some of their investigations at a meeting of the American Chemical Society at New Orleans on March 29. One of the substances that they have made from sugar, sucrose octa-acetate, has been found valuable in certain types of lacquers and adhesives and in the fabrication of paper. A similar product, sucrose benzoate, has applications in the same fields. By treatment of sugar with acid at high temperatures, a substance called levulinic acid is produced, and, when it in turn is combined with certain alcohols, fragrant esters are formed that have useful solvent powers. But of greatest interest is their investigation of the practice of mixing sugar in lime-sand mortar. Controlled tests have shown that, if as little sugar as 6 per cent. of the quicklime is included in mortar, the tensile strength is increased about 60 per cent. With the present low price of sugar, the addition of 5 or 6 lb. of sugar for each 100 lb. of lime adds little to the cost of laying bricks or plastering walls. The sugar is added dissolved in water after the lime has been slaked.

The Chemical Engineering Group

Meeting at Sheffield

SOME of the achievements of Sheffield in steel production, particularly in connection with resistance to heat and corrosion, were brought before chemical engineers on April 8, when the Chemical Engineering Group of the Society of Chemical Industry paid a visit to the East Hecla Works of Hadfields, Ltd.

In addition to the members of the Group the party included notable visitors in Mr. C. B. Brodigan (consulting engineer to Eriston Gold Mines), Mr. H. M. Ridge (N.C. Metal Co.), Major Wills (originally concessionaire of Victoria Falls Power Station, and acting chairman of the Gold Development Co. in Sumatra), and Professors F. C. Lea and I. C. F. Statham, of the University of Sheffield. Conducted by Mr. A. Roebuck (works director), Mr. W. J. Dawson (metallurgical director) and other officials, the party toured the rolling mills, foundries, forges, machine shops, and other departments of the works, and saw the production and treatment of steel of both the common and special alloy types. They were particularly interested in that part of the works which dealt with heat resisting and corrosion steels. They saw the melting of these metals in an electric induction furnace, and the operation of casting.

At tea, which was provided by the directors of Hadfields, Ltd., the thanks of the party were voiced by Dr. W. R. Ormandy, of the Distillers Co.

Mr. P. B. BROWN (deputy chairman), in reply, said they were endeavouring to develop some of the newer steels which could be applied to the chemical industries. A year or two before the war, if they approached any of the chemical manufacturers of the country and asked if they could make any of their plant, they were held at arm's length and told, " No, you know nothing about chemical plant; it all comes from Germany." He was glad to say that things had entirely changed. They found, by persevering, that many of the so-called highly abstruse qualities of steel and other metals used in the chemical industries were nothing but what they had been producing themselves for many years. When the war came, the chemical industry could not get supplies elsewhere, and that gave Sheffield a start. They were working in a new field, and their aim and object was to show that they could produce what the industry required.

The visit to East Hecla Works was followed by a meeting at the Royal Victoria Hotel, presided over by Mr. George Gray, of London (chairman of the Group), at which a paper on " Special Alloy Steels as Applied to Chemical Engineering " was presented by Messrs T. G. Elliot and R. J. Sarjant (Hadfields), and Dr. W. Cullen (past-president of the Institution of Mining and Metallurgy).

This paper included the results of research work which was only completed one or two days prior to the meeting. By way of introduction, Dr. Cullen discussed accepted views of the constitution of such steels, with references to recent published work, giving particulars of certain steels in regard to resistance to corrosion in acids, comparative loss of weight by scaling in works furnace atmospheres, and the effects of certain other gases. The mechanical properties of these steels at ordinary temperatures were also dealt with, and where relevant, the properties at high temperatures, including resistance to " creep." The types of deterioration experienced in the high chromium-nickel steels known as "corrosion-brittleness" and "weld-decay," and various suggestions to avoid these defects were then described, together with notes upon their working qualities, and the effects of certain processes of fabrication. Dr. Cullen also dwelt on the wide range of Sir Robert Hadfield's researches in alloy steels, and particularly instanced a semi-stainless steel, containing 9.1 per cent. chromium, which was made under his directions as far back as 1892. He acknowledged the debt which the chemical industry owed to non-corrosive steels, which he said had found their greatest application, and had scored a great success, in the manufacture of nitric acid.

Mr. GEORGE GRAY, presiding at a dinner which followed the meeting, voiced the thanks of the Chemical Engineering Group to Hadfields, and Mr. W. B. Pickering, a director of Hadfields, Ltd., replied. The toast of " The Chemical Engineering Group," was honoured on the proposal of Mr. R. J. Sarjant, and was acknowledged by Mr. D. Macdonald (hon. secretary of the Group).

Progress of Road Tar Technique

The Work of the British Road Tar Association

MR. W. E. CONE, technical adviser to the British Road Tar Association, in a paper presented to the Midland Junior Gas Association at Birmingham on April 7, traced the history of road tar and road making and the developments that have taken place in recent years. He showed that the existence of the British Road Tar Association had led to an increase in the employment of improved qualities of road tar and to a wider adoption of scientific control over technical operations. Although the tar and tar road industries have now behind them a wealth of experience extending over many years, much still remains to be done to meet the ever-growing demands of the highways. A feature of modern road traffic to-day is the increasing weight and speed of heavy vehicles, and roads must be built with an eye to the future. Any consideration of the future of the construction and maintenance of roads with tar must provide for development along scientific lines, and it should be borne in mind that the traditional and empirical methods of the past will have to make way for an improved road tar technique, based on a sound foundation of scientific knowledge. The foundation is now being laid, and the ultimate stability and permanence of the structure is the future task of the Association.

The importance of correct methods of applying road tar is being increasingly realised, and has an important bearing on the standard of road work to be obtained by its use. The present methods in vogue have, in essentials, stood the test of time, and have obtained very general acceptance. It is essential to meet the ever-increasing demands of highway transportation, and as a result of negotiations with tarmacadam interests, draft " Standard Specifications for the Construction of Roads with Tarmacadam and for the Maintenance of Roads with Tar," have been drawn up and approved, which will be the subject of a conference with the representatives of the competent highway associations. A draft specification for road emulsions of tar, pitch and mixtures has also received consideration, and several problems which have arisen in connection therewith are being studied. Although scientific workers have been engaged for many years in investigations on the constitution of tars, little has been done on the strictly practical side. As yet, there are many complex problems related to the use of tar for road-making, which are difficult of interpretation and solution by the present methods of chemical and physical survey. In an endeavour to obtain additional information, the Association is at present actively engaged in investigating the possibility of a research organisation being set up under the control of a joint committee of the Department of Scientific and Industrial Research and the Association.

Mr. D. W. PARKES said he had scientifically investigated several cases in which it had been suggested that fish in pools or streams near roads which had been dressed with tar had been killed by the liquids from the roads. In one case he found the death of fish was traceable to a rick fire, which produced an enormous amount of alkali in the ash. Again, fish had been killed following a heavy downpour of rain where there was a lot of silt in the water and the effect was to cause scouring. He agreed as to the great advantages of the high viscosity tars.

Mr. CONE said his own opinion was that the toxic effect of tars had been grossly exaggerated, and he believed the technical advisers of the Minister of Agriculture were now beginning to look for other reasons as to why fish had been killed.

The Conditioning of Boiler-Feed Water

By V. B. Harley-Mason

The following extracts are taken from a paper which was presented to members of the East Midlands Section of the Institute of Fuel, at their meeting at Nottingham, April 8. The author is chief engineer to the Manchester Steam Users' Association.

IN the list of impurities found in commercial waters the chemical salts that constitute "hardness" form only one category. Consequently, "water softening" which, as its name implies, consists of the removal of hardness, is only one part of the whole business of producing and maintaining satisfactory boiler water. A further complication is added by the fact that the water in a boiler is constantly changing its condition. The average boiler is installed by its owner to produce steam, and as long as it performs this function satisfactorily, the owner does not realise that other reactions may and do simultaneously take place. These reactions may be physical or chemical, or both. In the course of its operation a boiler is not only producing steam, it is also acting as an evaporating pan or concentrator. The impurities in the water go into the boiler and, with the exception of dissolved gases, stop there; they do not come out again with the steam. Any salts in solution will go on concentrating until, if no preventative means are taken, they are thrown down as a scale. It is the failure to appreciate this fact that leads to a large percentage of boiler troubles. Certain chemical reactions also take place, some of which are beneficial and others harmful. It is therefore the business of the boiler chemist to take advantage of the beneficial ones and neutralise or eliminate, as far as possible, those which are harmful.

Suspended Matter

In dealing with any particular type of water the first thing to do is to get rid of the suspended matter, if any. This can be done, in the case of larger or heavier particles, by filtration, or by means of settling tanks. Some suspended matter, however, may be so fine that it will pass through any commercially possible filter. This difficulty is got over by the use of a coagulant; that is, a chemical reagent which coagulates the fine particles into larger ones of sufficient size to be caught in a filter. The most commonly used coagulants are "alum" or sulphate of alumina. With the exception of "coagulation," the whole process of removing suspended matter is purely mechanical, and is far and away the least troublesome part of the business.

Hardness

Having got rid of suspended matter attention must next be turned to the dissolved salts, which constitute the "hardness" of the water. These salts are commonly referred to as "soluble" and "insoluble," "scale-forming" and "non-scale-forming." Of the compounds met with the following are the most common:—

Calcium Carbonate.—Found especially in water from chalky districts, non-corrosive, but forms a sludgy scale.

Calcium Sulphate.—Fairly soluble in cold water, but at boiler temperatures almost insoluble, non-corrosive, but forms a hard scale.

Calcium Chloride and Nitrate.—Only occasionally found and generally speaking gives little trouble. Being very soluble they are not liable to form scale, nor are they corrosive, although in conjunction with magnesium salts the chloride may form magnesium chloride, which is highly corrosive.

Magnesium Carbonate.—Found especially in waters from limestone districts; not directly corrosive, but in conjunction with other salts (especially chlorides) may produce corrosive results; forms a soft sludgy scale.

Magnesium Sulphate.—A soluble salt; by itself neither scale-forming nor corrosive, but in conjunction with other salts, especially chlorides and nitrates, can directly be responsible for both corrosion and scale.

Magnesium Chloride and Nitrate.—Frequently found in small quantities, very soluble and not directly scale-forming but highly corrosive owing to reactions that take place at boiler temperatrue.

All these compounds constitute what is known as "hardness." The carbonates depend for their solubility upon the presence of CO_2 in the water, and if this CO_2 is driven off they become insoluble and are immediately precipitated. In practice, however, the boiling process is not generally commercially possible as a means of removing temporary hardness and lime is usually used. The function of the lime is to combine with the CO_2, this renders the carbonates insoluble, and consequently they are thrown down as precipitates. They are then removed, partly by settling and by filtration. As an alternative to lime, caustic soda may in some cases be used. It has the advantage of being a less messy business, but its cost precludes its adoption. Permanent hardness is dealt with by means of soda-ash, the sulphates, chlorides, nitrates, etc., being turned into carbonates, precipitated and removed as before.

Water Softening Plant

These processes of dosing the water with lime and soda are carried on in an apparatus known as a "lime-soda softener"; of these there are two kinds—the "intermittent" and the "continuous." In the case of the intermittent type two large holding tanks are used. These are filled alternately, tested for hardness, treated, and the water run into the feed water system. As each tankful is separately tested and treated it is possible to get very accurate results provided reasonable care is taken. In the continuous plants the process of dosing is the same as before, except that it is done continuously and automatically as the water runs through the softener. Theoretically speaking, every gallon of water that runs through automatically doses itself with the correct amount of lime and soda. In actual practice, however, such accuracy is never attained and it is generally recognised that about 10 per cent. in excess of the theoretically correct amount of reagent is necessary in order to ensure the reactions being complete.

It is generally reckoned that the chemical processes of softening take about two hours to complete, hence the first essential of such a plant is a tank that will contain an amount of water equal to two hours of maximum demand. This is fitted with a float valve that automatically keeps it full. The second essential is a proportioning apparatus. This is generally of the tipping bucket type. The incoming water fills a bucket or holder, so arranged that when full it overbalances and tips the contents out. The motion thus produced is used to operate mechanism for measuring out predetermined amounts of soda and lime, as may be required. In order that the proportioning may be correctly carried out it is desirable to have the lime and soda in liquid form. The soda solution is generally prepared in a small tank capable of holding a 24-hour supply; this can either be placed at the ground level with a small hand pump for delivering it to the reagent tank at the top of the softener, or it can be placed on some suitable platform, from which it is run into the proportioning apparatus by gravity. Lime is either used in the form of milk of lime or a "saturator" can be used.

The Zeolite System

The duty of the softener is to throw various harmful constituents out of solution and precipitate them. The bulk of the precipitates fall to the bottom of the tank by gravity, but some are too fine for this and they remain in suspension, hence the next essential is a good filter to catch them and prevent them leaving with the outgoing water; such filters are usually made of wood wool or felt, although sand is sometimes used. The water is usually arranged to travel *upwards* through wood filters, but for obvious reasons must pass downwards through sand filters. A means for removing sludge must also be provided; this generally takes the form of a large straight through-cock at or near the bottom of the tank.

In the Zeolite or base-exchange system the water is passed (generally in an upward direction) through a bed of Zeolite material, which is a mineral substance containing sodium and possessing the power of exchanging the sodium for the

calcium and magnesium in the water. The action is merely analogous to the passage of oxygen through the fuel bed of a furnace, the only difference being that whereas the oxygen in its passage takes carbon away with it and leaves nothing behind, the water passing through a Zeolite bed takes sodium away, but in exchange leaves calcium and magnesimu behind. The point to emphasise, however, is that in this case there is no measuring to be done and consequently no proportioning gear is necessary. So far as treatment for permanent hardness is concerned the results of both systems are the same, *i.e.*, calcium and magnesium salts are converted to sodium salt, which latter remain in the water and are carried away with it, but in the treatment of temporary hardness the results are quite different.

Whereas the lime process leaves nothing in the water the Zeolite process produces sodium salts which remain in solution. Consequently, if there is much temporary hardness present the Zeolite process leaves much more sodium salt in the water than does the lime-soda process, hence concentration and its attendant troubles are greater. On the other hand, the Zeolite process is capable of far greater efficiency than the lime-soda process, being capable of removing all the hardness and producing water of, what is known as "zero-hardness," whereas the lime-soda process will seldom reduce the hardness to a point lower than three or four degrees. The softening process goes on uninterruptedly until all the sodium in the Zeolite is exhausted. It is not then necessary to renew the Zeolite with a fresh charge, for it is possible to revivify it by passing a strong solution of brine (*i.e.*, water containing sodium chloride) through it. The reverse exchange process then takes place, the sodium from the chloride is put into the Zeolite and the calcium and magnesium are taken away.

De-Oiling

Where steam is used for driving reciprocating engines the condensate invariably contains oil; it may be only a small percentage, but still it is there, and it is absolutely essential to remove it if the water is to be used for boiler feed. A large percentage of the oil entrained in the steam can be removed by means of mechanical separators. These consist of baffles, placed in the path of the steam, arranged to catch the oil drops and drain them away to a sump; but no matter how scientifically these may be arranged, nor how tortuous the steam passage may be, these devices never remove the whole of the oil, and other means have to be adopted after the steam has been condensed.

The oil in the resultant condensate is generally so finely divided that it will not separate by levigation, not even if left standing for twelve months, and it cannot be caught in any filter, however fine. The best and practically only way to get rid of it is by "coagulation" and filtration; this may be effected either by chemical or electrical methods. The chemicals used are sulphate of alumina, commercially known as alumino-ferric and caustic soda, and the action of the de-oiler is similar to that of the ordinary water-softener. A measured amount of the sulphate solution is first added to the oily water, and then later a solution of caustic soda in quantity just sufficient to effect the precipitation of the whole is added. The precipitate so formed is flocculent in character and has the effect of entangling the minute globules of oil, so that when the precipitate is filtered off the oil is retained with it at the filter. Great care is necessary to get satisfactory results. In the first place, sulphate of alumina is corrosive and ordinary metal tanks should not be used to hold it. Slate or lead lined tanks are far better. Secondly, on account of its corrosiveness, it is essential that sufficient caustic soda be used to ensure its complete precipitation, but, on the other hand, if any excess of soda be used, the precipitate redissolves and the efficacy of the process is impaired.

The electrical method is carried out in a suitable holding tank containing closely speced grids or plates of iron. The oily water to be treated is made to flow between the grids and an electric current is passed through it from grid to grid. The effect is similar to the chemical method, the oil globules are entangled in a flocculent precipitate, which in this case is iron hydroxide. If the quantity of oil-bearing water is small compared with the total water feed, it may be dealt with by simply putting it through the softener. The precipitates formed by the softening process entangle the oil in the same fashion as described above, and the filter of the softener removes the two together, but if, on the other hand, the quantity is large, a special plant must be fitted for the purpose.

Dissolved Gases

Of these there are two that really matter—oxygen derived from the atmosphere is the worst offender, and CO_2, derived partly from the atmosphere and partly from the ground through which the water has passed, runs it a close second. Between them they are responsible for most of the pitting and corrosion met with in boilers. They are far more troublesomesome in high-pressure tubular boilers with steel tube economisers, but even with ordinary shell boilers, working with pressures up to say 150 to 200 lb., they at times cause quite a lot of damage and their removal may become imperative.

Where the amount of dissolved gas is not large, feed-water heaters of the cascade type, if suitably vented, are quite effective. They will remove the bulk of the trouble and any residue can be dealt with by chemical absorbers, such as tannin, or by passing the water through a filter bed of finely divided iron. In more serious cases it is necessary to employ a "de-aerator" or "de-gasser." Of these there are several makes on the market, but the underlying principle of them all is much the same. It consists of raising the water to a high temperature, say 200° F., or higher, breaking it up into a spray, agitating it by pouring it over baffles, generally in the form of steam-heated tubes, and at the same time subjecting it to a reduced pressure. The whole process may be likened to a combination of carpet beater and vacuum cleaner.

Chemical Work for the Admiralty

An Institute Visit to Portsmouth

MEMBERS of the London and South Eastern Counties Section of the Institute of Chemistry of Great Britain and Ireland visited Portsmouth on April 7. They were received by the Portsmouth members of the Section and were taken to the Department of the Admiralty Chemist in the Dockyard, where they inspected the chemical laboratories in which were displayed typical examples of the chemical work being carried out for the Admiralty. Particular interest was shown in the chemical tests which were being carried out in conjunction with H.M.S. Dolphin to ensure the efficiency of the Davis submerged escape apparatus and in the details of the patented process designed by the department and used by the Admiralty for the recovery of oil fuel from ships' residues, in connection with the international agreement against pollution of the sea shore with oil.

The visitors were then conducted over H.M.S. Hood and Victory, and afterwards adjourned to the Municipal College, where they were entertained to tea by the Portsmouth members. In the unavoidable absence of the Principal, Mr. Benny, they were welcomed to the College by Mr. Watson, the head of the chemistry department, and later inspected the college laboratories, which have been recognised by the Institute as a training centre for candidates for admission to their associateships.

Mr. E. B. HUGHES, in the absence of the chairman of the section, thanked Mr. Edmed, the Admiralty Chemist, for his kindness in allowing them to see the work of his department and for arranging for the very enjoyable visits to the Hood and Victory.

Mr. EDMED, in reply, welcomed the visitors and said it was a great pleasure to the Portsmouth members to entertain the London section. This was the first time such a meeting had been held outside London, and he felt that it was a good thing for the Portsmouth members of the section, who naturally found it difficult to attend the London meetings, to have this opportunity of coming in touch with their fellow members He also wished to thank Mr. Benny, the Principal of the Municipal College, for his kindness in placing the college at the disposal of the section, and for assistance in making the necessary arrangements which had enabled them to entertain the visitors to tea.

Mr. WATSON also briefly thanked the section, and said it was a pleasure to meet the members of such a distinguished body as the Institute of Chemistry and hoped they would again visit them in the future.

The Federation of British Industries

The President's Annual Review

At the annual general meeting of the Federation of British Industries held on Wednesday, April 13, Sir James Lithgow, retiring president, reviewed the present position of industry. The main points of his speech were a comparison between the national crisis in August, 1914, and in August, 1931; a warning given by industry before the crisis on the misdirection of the national policy, particularly with regard to fiscal policy and public expenditure; a review of the benefits that can be derived from the new fiscal system, and of the dangers to be avoided in carrying it out; the urgent necessity for a reduction in the cost of government; and a reference to the forthcoming Imperial Conference.

Future students of British history, he said, may well draw a close parallel between the years 1914 and 1931. In both years those in touch with world events had long been regarding the future with apprehension and in the month of August the British public were aroused from their complacency by a crisis which shook the nation to its foundations. In 1914, after the first shock of surprise had spent itself, the people generally failed to appreciate the magnitude of the task ahead, and the Government of the day either made a similar miscalculation or feared to take the nation sufficiently into its confidence. With the experience of 1914 fresh in our memories it is well to emphasise that the crisis of 1931 likewise demands strenuous, prolonged and general effort if we are to be spared another attempt at the traditional British method of muddling through, which in a struggle of this character may well prove fatal to our recovery.

A Complete Reversal of Policy

It was of the highest importance that the Federation should keep the closest possible contact with the other associations which represent the point of view of industry and commerce in its various phases. It was encouraging to find that the fiscal issue had been tackled boldly and that a complete reversal of policy is being carried through, but the Federation can justly claim credit for bringing home, not only to industrialists themselves, but to the general public that changed world and domestic conditions called loudly for a review of this matter. The responsibility for the proper use of our new system now rests upon those engaged in industry. To be fully successful it must be loyally supported by those who plan, by those who direct, and by those who carry out every operation of production. Efficiently planned and well-managed plants, manned by willing and energetic workers, must be supported by ancillary services operating with equal efficiency.

Purchase in the cheapest market of the materials required for our industrial operations and for the consumption of our people was the most efficient national policy so long as the resultant savings were reflected in the costs of our own manufacturers, and so long as we were able to sell our products in satisfactory quantity in the markets of the world. Since domestic policy, through standardisation of emoluments and national burdens, had brought about a rigidity in our economics which prevented these cheap purchases being fully reflected in our manufacturing costs, and since international policy had closed many of the markets of the world to us, it was no longer possible for us to sell our goods in satisfactory quantity indiscriminately throughout the world. In these circumstances the nation had realised that it was necessary to change our national policy so as to protect the products of our own industry from the competition offered to them by competitors unhampered by our burdens and unbound by our efforts to maintain a higher standard for our people. Those acquainted with large industrial operations knew that an assured and steady market was the essential basis of efficient production, quite apart from the more controversial consideration of the scale of that production.

The Burden of Public Expenditure

The cost of public extravagance, falling as it had for the most part on the shoulders of those who had devoted their energies or their capital to our heavy industries, had given rise to the fear that the future held out no hope of reward to these investors, and had created feelings dangerously approaching to resentment at the penal nature of the taxation which had been imposed. So long as direct taxation was permitted to remain at anything approaching its present level, faith and hope rather than gratitude must be our attitude to a Chancellor grappling with a tremendous task. Expansion of expenditure had been stopped, and severe curtailment of purchases was being enforced, but it was impossible to feel confident from the published returns that a real change of heart had been effected in the minds of those who conceive their function to be to regulate rather than to govern.

Chemical Industry Lawn Tennis Tournament

The Chemical Age Silver Cup

British Summer Time commences this week-end, and the summer lawn tennis season will soon be in full swing. The second annual Chemical Industry Lawn Tennis Tournament, in competition for The Chemical Age Silver Cup, will afford members of the chemical industry an opportunity of meeting in friendly combat on the courts, and we expect to receive numerous entries in the next few days. The tournament is limited to men's doubles and is open to all engaged in any capacity in the chemical industry throughout the country. Country members of the industry are particularly invited to compete. For all the earlier rounds the country will be divided into areas, so that opposing pairs may obviate the inconvenience of travelling considerable distances and may meet each other as near home as possible. The simple rules of the Tournament have been printed in full in recent issues of The Chemical Age, and the entry form is appended. Copies of the rules and further entry forms may be obtained on application to the Editor.

[The Latest Date for Receiving Entries is May 2, 1932].

Cut along this line and post as directed.

Entry Form

We have read the Rules of The Chemical Age Lawn Tennis Tournament, and agree to abide by them.

Name of Competitor ..... *Name of Competitor* .....

Name of Firm..... *Name of Firm*.....

Firm's Address..... *Firm's Address*.....

....

Telephone No. .... *Telephone No.* .....

Cosach Nitrate Combine

Reported Proposal for Conversion of Bonds and Shares

A PROPOSAL designed to lighten the burden of interest at present carried by the Cosach nitrate combine is said by the *Southern Pacific Mail* to have been put forward by Mr. Medley Whelpley, the president of Cosach, at a meeting in New York with its creditors and bankers. According to this paper (quoted in a Reuter message from Santiago) Mr. Whelpley asked that holders of bonds should agree to take preferred shares in substitution for their bonds, and that this conversion should apply to 85 per cent. of their bond holdings.

Mr. Medley Whelpley, it will be recalled, recently visited New York in connection with meetings of Cosach's international creditors, bond-holders and other interests, to whom he submitted a scheme of reorganisation approved by the Chilean Government following the report of a Government Commission on the company's affairs. British banking interests were represented at these meetings by Mr. Henry Tiarks, of J. Henry Schröder and Co., and Sir Bertram Hornsley, chairman of the Anglo-South American Bank. Mr. Tiarks left for England a few days ago, which was interpreted in the New York Press as evidence that the discussion had been successful and that authority had been received to proceed with the reorganisation plan.

Oil and Colour Chemists' Association

Annual Meeting of Manchester Section

THE annual meeting of the Manchester Section of the Oil and Colour Chemists' Association was held at Manchester on April 8, when Mr. G. A. Campbell presided.

The annual report and financial report were presented by the hon. secretary, Mr. H. Clayton, and the treasurer, Mr. F. Sowerbutts, and were unanimously accepted. These showed the Society to be in a better position both numerically and financially than it had ever been. Mr. S. T. Kinsman and Mr. R. S. Royle were appointed members of the committee to take the place of the retiring members, Mr. Archer and Mr. Kelleher.

Mr. HANCOCK, who moved a vote of thanks to the chairman on his termination of two years' service, said that the present flourishing and advanced state of the Section was due in no small way to the chairmanship of Mr. Campbell. Two years ago he had the pleasure of proposing the vote of thanks to Mr. Bridge, who lifted the Section to the level of the other older scientific societies, and Mr. Campbell had now carried the Section beyond this critical stage and firmly established it as one of the leading scientific societies in Manchester. Mr. Sowerbutts seconded the vote of thanks.

Mr. CAMPBELL, in reply, thanked the members for the kind things that had been said, but felt that these compliments should be passed on to the committee and particularly to the secretary for whom he had nothing but the highest praise. He said he would like to take this last opportunity, as chairman, of suggesting that any future committee should see that the craftsman type of paper had a place in each year's syllabus. The academic research paper recorded facts newly discovered, but research was invariably 50 years ahead of works practice and a society should remember that they formed a link between research and its application by the works chemist.

Mr. NOEL HEATON, president, commended the Society on its increased status and particularly on the work it had done in the formation of a joint committee with other Manchester scientific societies. He congratulated the section on the success of its annual dinner, and thought that the Society, as a whole, could be fully satisfied with the progress that had been made in the past twelve months.

The meeting was followed by a smoker and an enjoyable evening was spent.

German Dye Trust Dividend

THE *Boersen Courier* learns that the board of the I. G. Farbenindustrie proposes to pay a dividend of 7 per cent. for 1931. For the previous year 12 per cent. was distributed. It is rumoured that shareholders may be asked to sanction some reduction of capital.

Chemical Matters in Parliament

Allied Silica and Chemical Products, Ltd.

IN the House of Commons on Tuesday, April 12, Mr. A. M. Lyons (Leicester, East) asked the President of the Board of Trade if he had considered the request from shareholders of the Allied Silica and Chemical Products, Ltd., for an investigation by the Board of Trade under Section 135 of the Companies Act, 1929, into the affairs of that company; whether he had had representations made as to the hardship that would be entailed by those applying if security for costs of the inquiry had to be furnished; and whether he would, in the public interest, order such investigation to take place without requiring any security?

Mr. RUNCIMAN replied that he had considered the request of shareholders of the company for an investigation under Section 135 of the Companies Act, 1929, into the affairs of the company but it did not appear to him that any useful purpose would be served by the appointment of an inspector since, so far as he was aware, no directors or other officers of the company could be traced and the company did not appear to have any offices or books.

Mr. LYONS: May I ask the Right Hon. Gentleman, seeing that the company has ceased to function and that a number of shareholders have lost the whole of their investments in the concern, he will bring the matter to the notice of the Director of Public Prosecutions with a view to his giving such consideration, and taking such action as the matter justifies?

Mr. RUNCIMAN: I will look into the matter again and communicate with the hon. member.

British Drug Houses, Ltd.

Fall in Profits

SPEAKING at the annual general meeting of British Drug Houses, Ltd., held in London on Wednesday, April 13, Mr. C. A. Hill, chairman and managing director, said that the fall in profits had been aggravated by an exceptional cause—namely, a loss in connection with the trading of the subsidiary company, the British Drug Houses (Canada), Ltd. It was most regrettable that the first year of this company's trading in Canada synchronised with a period of great trade depression in that country. It was not to be expected that even under the most favourable conditions the venture would yield actual profit during its first year. In point of fact, the worst possible conditions prevailed, so that the company's activities were adversely affected and the loss on the year's working was heavier than was budgeted for. This loss had been fully provided for in the accounts of the parent company now presented.

The Rio Tinto Co. Ltd.

A Sharp Fall in Net Trading Profits

THE net trading profit of the Rio Tinto Co., Ltd., the copper and sulphur mining concern, fell sharply from £1,070,400 in 1930 to £424,894 last year; other credits, however, were higher, being £86,124 against £71,292. After providing for administration and other expenses, etc., of £410,833, there was a net profit of £100,185, in contrast with £686,966 in the previous year. Adding £384,367 brought forward, there was available £484,552, of which £81,250 was absorbed by the preference dividend, leaving £403,302 to go forward. In consequence, it is recommended by the directors that no ordinary dividend be paid, whereas in 1930 shareholders received 20 per cent., with 50 per cent. and a bonus of 5 per cent. in 1929.

During the year, states the report, the world-wide depression in the industries which chiefly affect the company, *i.e.* the non-ferrous metals, the iron and steel and the chemical (including fertiliser) industries, has been accentuated. The world consumption of copper in 1931 is estimated at 1,355,200 short tons, which compares with 1,731,713 tons in 1930. This represents the lowest world consumption since the year 1923. The production of iron and steel in Europe fell from over 92,000,000 tons in 1930 to rather under 72,000,000 tons in 1931, a reduction of 22 per cent., while the total deliveries of pyrites by all European mines declined from 5,680,000 tons in 1930 to 4,350,000 tons in 1931, a reduction of 23½ per cent.

News from the Allied Industries

Paper Industry

A STRIKE AFFECTING 17,000 workers was declared for April 11, following the failure of negotiations for a new labour agreement at the Swedish pulp mills.

Rubber

HAVING EXHAUSTED ITS CASH RESOURCES, the South Perak Rubber Syndicate proposes to reconstruct, a new company being formed with a capital of £60,000 in £1 shares, which will be issued 17s. 6d. paid. The directors consider it desirable to ensure, if possible, that the whole of the 60,000 shares will be taken up, so that cash will be provided to the extent of £7,500 subject to deduction of commission and expenses of reconstruction.

Iron and Steel

THE UNITED STEEL WORKS CO. (the German Steel Trust) reports that for the quarter January to March the turnover declined by £1,375,000 (at par) to £5,835,000. This decrease was due mainly to the smaller exports, which fell 47.2 per cent. compared with the corresponding period of last year. Exports during the quarter totalled £1,260,000, against £1,845,000 in the previous quarter. Home sales were little changed at £3,985,600, against £4,100,000.

RAW STEEL PRODUCTION FIGURES for February show that all countries embraced in the International Raw Steel Cartel, with the exception of France, were able to increase their output over the previous month. The French decline was 5,000 tons, whereas Germany showed an increase of 48,000 tons, the Saar area 14,000 tons, Luxemburg 10,000, and Belgium 4,000. The aggregate output, however, fell below the quota. The actual production figures for February were: France, 464,000 tons; Germany, 448,000 tons; Belgium, 242,000 tons; Saar, 125,000 tons; and Luxemburg, 156,000 tons.

THE NATIONAL FEDERATION OF IRON AND STEEL MANUFACTURERS states that there were 72 blastfurnaces in operation at the end of March, a net increase of one since the beginning of the month, one furnace having ceased operations and two having been blown in. The production of pig-iron in March amounted to 335,600 tons, compared with 323,600 tons in February and 357,100 tons in March, 1931. The production includes 65,800 tons of hematite, 133,000 tons of basic, 114,100 tons of foundry and 14,200 tons of forge pig-iron. The output of steel ingots and castings amounted to 462,800 tons, compared with 480,600 tons in February, and 500,100 tons in March, 1931.

Artificial Silk

ACCORDING TO STATISTICS compiled by the Snia Viscose Co., the production of rayon in the world during 1931 was 473,000,000 lb. and the consumption 495,000,000 lb., the difference of 22,000,000 lb. being satisfied by drawing upon existing stocks. Compared with 1930 the consumption last year showed an increase of 28 per cent., whereas there was only an improvement of 10 per cent. in production. The distribution of the rayon industry in the world is given in the following table:—

	Production. '000 kilos.	Consumption. '000 kilos.
Belgium	4,500	2,000
Czecho-Slovakia	2,500	5,000
France	17,000	10,000
Germany	26,000	30,000
Great Britain	24,500	23,000
Italy	34,600	12,000
Holland	8,400	1,000
Poland	2,400	2,000
Spain	1,200	3,500
Switzerland	4,600	2,000
British India	—	3,500
China	—	10,000
Japan	21,000	18,000
Canada	2,400	3,500
United States	65,000	68,000
Australia	—	1,500
Other countries	900	30,000
Aggregate totals	215,000	225,000

Tanning

ACCORDING TO A BULLETIN issued by the Soviet Chamber of Commerce at Moscow, it has been discovered at the Novorossisk Scientific Research Institute that a certain type of slag can be used to replace vegetable tannin in the tanning of leather. The report states that, in view of the lack of roots which have been required by this process, this discovery is extremely valuable, and by the use of the slag the cost of tanning will be reduced seven times, effecting a saving of two and a half million roubles a year in the entire leather industry of the Soviet Union. The experiments have proved that a good quality of leather can be produced by tanning with slag.

Sugar Industry

THE SECOND LINCOLNSHIRE SUGAR CO., in conjunction with other English sugar companies, have issued a protest against what they allege is an organised propaganda directed against the home-grown sugar industry during the last four or five months. They urge that in view of Parliament having initiated a system of general production with a Tariff Board, it is of supreme importance that Parliament should review and appreciate the results of the Sugar Subsidy Act. The factories claim that under the Act there has been created in Great Britain a joint agricultural and industrial organisation which, as it stands, has been able to produce over 400,000 tons of sugar per annum, an amount approximating to 20 per cent. of the national consumption; that 40,000 British farmers have grown crops totalling 350,000 acres for eighteen factories, and that the factories gave employment in 1930 to 9,900 workers, and a permanent staff of 645 technical and other officials. In regard to agricultural employment in the year 1929 on a crop of 230,000 acres it was estimated that over £5,500,000 was expended on manual labour. These factories also contend that their organisation is simple, effective and efficient, that there is a definite measure of enthusiasm for sugar beet, and that, given some degree of stability in the agricultural industry as a whole, the British farmer will bring the present beet tonnage per acre up to a figure quite comparable with that of other European countries.

Seed Crushing Trade

DETAILS OF THE SEED-CRUSHING TRADE for 1930 are now available from the *Fourth Census of Production*, in the report of which particulars for 1930 and 1924 are given relating to returns received from firms in Great Britain whose business consisted entirely or mainly in the extraction of oils from vegetable seeds, nuts, or kernels. The figures for 1930 cover 58 establishments at which operatives were employed, but the returns for that year are outstanding from establishments that employed in 1924 about 140 persons, or 1 per cent. of the total number recorded for that year. The total cost of materials used amounted to £19,679,000 in 1930, as compared with £32,512,000 in 1924; the net output was £2,389,000, as compared with £3,910,000; and the net output per person employed £212, as compared with £279. The following table shows the amount of raw material imported in 1930 and 1924, respectively:—

	Retained Imports (tons). 1930	1924
Coconut	67,300	70,800
Cotton seed	516,700	558,300
Ground nuts	113,900	88,300
Linseed	222,900	444,100
Palm kernels	125,700	287,600
Soya beans	91,300	111,500
Rape seed	9,800	66,300
Other	68,300	99,200
Total	1,215,900	1,726,100

During 1930 and 1924 the average number of operatives and of administrative, technical, and clerical staff employed by firms that made returns on schedules was 11,249 and 14,027, respectively, the number of operatives (mostly males over 18) being 9,521 and 12,061, showing that the numbers employed have been reduced by about 20 per cent.

British Overseas Chemical Trade in March

Considerable Decrease in Imports

Exports of chemicals, drugs, dyes and colours during March amounted to a total of £1,544,934, which is £148,241 higher than the figures for March, 1931. Imports totalling £814,798 were lower by £328,050, and re-exports totalling £48,517 were higher by £5,096, as compared with March, 1931.

	Quantities. Month ended March 31. 1931.	1932.	Value. Month ended March 31. 1931. £	1932. £
Imports.				
Acetic Anhydride cwt.	639	763	1,991	2,271
Acid, Acetic .. tons	551	574	21,815	19,313
Acid, Tartaric, including Tartrates .. cwt.	4,753	733	20,549	1,504
Bleaching materials ,,	8,325	5,678	12,090	4,570
Borax .. .. ,,	24,999	16,998	14,361	8,401
Calcium carbide .. ,,	75,205	24,975	45,712	16,062
Coal Tar Products, not elsewhere specified value	—	—	12,577	1,763
Glycerine, Crude .. cwt.	9,607	4,400	15,165	5,940
Glycerine, Distilled ,,	2,036	—	4,454	—
Red Lead and Orange Lead .. .. cwt.	3,393	1,038	4,466	1,453
Nickel Oxide .. ,,	186	73	870	345
Potassium Nitrate (Saltpetre) .. .. cwt.	12,669	10,920	10,823	10,325
Other Potassium Compounds .. .. cwt.	356,354	192,997	102,583	73,555
Sodium Nitrate .. ,,	51,572	69,300	22,985	24,000
Other Sodium Compounds cwt.	41,203	35,086	26,759	22,042
Tartar, Cream of .. cwt.	2,000	342	8,022	1,873
Zinc Oxide .. tons	734	52	17,275	950
Other chemical manufactures .. .. value	—	—	216,885	230,524
Quinine and Quinine Salts ozs.	203,324	55,720	13,788	6,320
Bark Cinchona (Bark Peruvian, etc.) .. cwts.	275	1,295	1,248	6,240
Other drugs .. value	—	—	207,757	87,553
Intermediate Coal Tar Products .. cwt.	34	67	408	915
Alizarine and Alizarine Red .. .. cwt.	55	—	2,243	—
Indigo, Synthetic ,,	—	—	—	—
Other dyestuffs .. ,,	5,251	3,700	105,506	89,501
Cutch .. .. ,,	5,369	4,678	9,006	5,430
Other extracts for dyeing cwt.	3,088	6,294	9,171	22,749
Indigo, Natural .. ,,	71	19	2,209	303
Extracts for Tanning ,,	90,308	85,196	87,747	71,747
Barytes, Ground .. ,,	43,618	10,428	8,847	2,328
White Lead (Dry) ,,	11,426	5,686	16,516	7,727
Other painters' colours and materials .. cwt.	92,132	87,756	119,020	89,379
TOTAL .. value	—	—	1,142,848	814,798
Exports.				
Acid, Sulphuric .. cwt.	9,190	8,352	3,404	4,201
Acid, Tartaric, including Tartrates .. cwt.	591	469	3,234	2,497
Ammonium Chloride (Muriate) .. tons	542	469	6,523	7,895
Ammonium Sulphate ,,	25,821	37,125	187,961	195,959
Bleaching Powder (Chloride of Lime) .. cwt.	27,420	29,574	8,361	10,481
COAL TAR PRODUCTS—				
Anthracene .. cwt.	—	—	—	—
Benzol and Toluol gal.	707	2,654	78	269
Carbolic Acid (crude) ..	4,906 gal.	187 gal.	753	52
Carbolic Acid (crystals) cwt.	615	1,037	1,545	3,230
Cresylic Acid .. gal.	51,438	122,671	6,632	13,419
Naphtha .. ,,	4,918	1,790	513	151
Naphthalene (excluding Naphthalene Oil) cwt.	8,663	9,158	2,016	3,218
Tar Oil, Creosote Oil, etc. .. .. gal.	118,228	1,409,436	4,207	33,225
Other sorts .. cwt.	10,456	19,850	6,337	9,024
COAL TAR PRODUCTS Value	—	—	22,081	62,588
Copper, Sulphate of tons	5,497	8,197	103,065	145,558
Disinfectants, Insecticides, etc. .. .. cwt.	26,672	22,967	58,163	47,206
Glycerine, Crude .. cwt.	918	1,976	1,101	2,471
Glycerine, Distilled ,,	4,424	16,333	11,130	35,134
Potassium Chromate and Bichromate .. cwt.	1,032	1,268	2,138	3,394
Potassium Nitrate (Saltpetre) .. .. cwt.	874	1,651	1,526	2,776
Other Potassium Compounds .. .. cwt.	6,685	4,579	9,452	5,375
Sodium Carbonate, including Soda Crystals, Soda Ash and Bicarbonate cwt.	298,515	383,972	83,936	104,331
Caustic Soda .. ,,	133,440	151,425	90,110	100,591
Sodium Chromate and Bichromate .. cwt.	1,278	2,550	2,155	5,250
Sodium Sulphate, including Salt Cake .. cwt.	27,743	12,293	3,608	2,402
Other Sodium Compounds cwt.	33,044	85,232	43,622	75,043
Zinc Oxide .. tons	283	923	6,598	18,897
Other Chemical Manufactures .. .. value	—	—	215,169	217,420
Quinine and Quinine Salts ozs.	145,086	48,949	12,969	5,747
Other drugs .. value	—	—	215,774	192,615
Dyes and Dye-stuffs (Coal Tar) .. .. cwt.	10,901	12,119	86,330	103,755
Other Dye-stuffs .. cwt.	7,624	18,092	9,098	16,641
Barytes, Ground .. cwt.	4,624	1,845	1,836	903
White Lead (dry) ,,	2,125	1,198	3,600	2,459
Paints and colours in paste form .. .. cwt.	24,294	19,530	45,701	34,178
Paints and enamels, prepared .. .. cwt.	32,814	22,385	96,995	67,331
Other painters' colours and materials .. cwt.	33,056	38,920	61,053	71,836
TOTAL .. value	—	—	1,396,693	1,544,934
Re-Exports.				
Acid, Tartaric, including Tartrates .. cwt.	73	58	484	394
Borax .. .. ,,	40	951	25	779
Coal Tar Products not elsewhere specified value	—	—	5	9
Potassium Nitrate (Saltpetre) .. .. cwt.	2,582	738	2,302	697
Sodium Nitrate ... ,,	1,188	8,034	601	3,584
Tartar, Cream of .. ,,	248	95	1,239	485
Other chemical manufactures .. .. value	—	—	8,854	8,178
Quinine and Quinine Salts ozs.	7,936	7,126	951	865
Bark Cinchona (Bark Peruvian, etc.) .. cwt.	320	427	2,422	4,477
Other drugs .. value	—	—	20,331	23,788
Cutch .. .. cwt.	1,147	733	1,786	1,122
Other extracts for dyeing cwt.	139	145	850	728
Indigo, Natural .. ,,	—	1	—	31
Extracts for Tanning ,,	1,490	2,074	1,809	1,784
Painters' colours and materials .. .. cwt.	753	503	1,568	1,196
TOTAL .. value	—	—	43,421	48,517

Decline in German Fertiliser Sales

ACCORDING to a recent official census, the decline in the sales of fertilisers in Germany during the first six months of the fertiliser year, 1931-32, is estimated at 50 per cent. for nitrogen, 20 per cent. each for superphosphate and basic phosphate slag and as high as 63 per cent. for fertiliser lime. The decline in the total sales of potash salts, in both the domestic and foreign markets, was 28 per cent. in the calendar year 1931.

From Week to Week

BRITISH SUMMER TIME commences at 2 a.m. on Sunday. All clocks should be put forward one hour to-night (Saturday).

RECENT WILLS include:—Mr. T. V. Anderson (68), of Bristol, and 94 North Gate, Regent's Park, N.W., chairman of Andersons Rubber Co., £77,753 (net personalty £72,911).

MR. MYRAM C. PICKER, president of the Crystal Chemical Co., Inc., of New York, has sailed for England to complete arrangements for manufacturing cosmetics in this country.

JOSEPH ELIE, LTD., are contemplating the construction of an oil refinery at Montreal. The cost of the plant is estimated at £200,000 and it will be erected in close proximity to the oil refineries of the British American Oil Co., Ltd.

BRITISH GLASS MANUFACTURERS are reported to have sent offers of work to a number of glass workers of Haida, in the Bohemian glass-making district. The acceptance of these offers, the local newspaper fears, will result in the partial removal of the industry to Great Britain.

PROFESSOR H. E. ARMSTRONG, Emeritus Professor of Chemistry at the City and Guilds of London College, will deliver a Friday evening discourse at the Royal Institution, on May 20, when his subject will be "Faraday at the Sign of the Hexagon: Coal Colour and Constitution."

MEMBERS OF THE CHEMICAL ENGINEERING GROUP are invited by the Council of the Institute of Fuel to a meeting to be held at Burlington House on May 11 at 6 p.m. when Professor Ernst Berl, of Darmstadt, will deliver a paper on "The Artificial Formation of Bituminous Coal and Mineral Oil Hydrocarbons."

LONG SERVICE MEDALS have been presented to five members of the Washington Chemical Co., Durham, whose names are Samuel Sproul (39 years), W. J. Lynch (35 years), T. Wilkinson (38 years), Mary Dow (31 years) and Ruby Wright (29 years' service). The presentations were made by Mr. G. Stirling Newall, chairman of the company.

THE ORDER FOR OIL PIPE LINE for the Iraq Petroleum Co. has now been definitely placed. The order for the tubes has been distributed among the tube makers of the United Kingdom, the Continent and America, and the British Mannesmann Tube Co., Ltd., has been allotted a considerable share of this order. The two works of the British Mannesmann Tube Co., Ltd., are situated in South Wales.

THE POLISH GOVERNMENT intends in the near future to issue a decree which will ensure Government control of oil production and marketing both at home and abroad. According to newspaper reports, the Government is negotiating with representatives of the Standard Oil Co. with a view to granting the company a monopoly of the sale of oil products in Poland. The Concession, if granted, would be coupled with a long-term loan of $8,000,000 to the Polish State.

SALPA ITALIANA, of Turin, the well-known manufacturers of artificial leather, is reported to have ceased production. The reason is stated to be that the present low price of leather has made the production of artificial leather unprofitable. Later information is to the effect that the company has applied to the court for permission to compound with its unsecured creditors on a 40 per cent. basis. The assets are stated to be 4,306,000 lire (£46,552 at par), with liabilities 6,176,000 lire (£66,767), exclusive of share capital, 35,000,000 lire (£345,881).

THE PROPOSED FUSION OF THE VINEGAR BUSINESSES of Champion and Slee, Ltd., and Sarsons, Ltd. (controlled by Crosse and Blackwell), Beaufoy Grimble and Co., Ltd., and the Distillers Co., Ltd., has now been carried a stage further. It is understood that the interests of the three groups in the combine will be approximately as follows: Crosse and Blackwell 42 per cent., Beaufoy Grimble 21 per cent., and Distillers 37 per cent. All the parties to the fusion will be represented on the board of the proposed new company, and it is understood that Mr. G. M. Beaufoy, the present managing director of Beaufoy Grimble and Co., Ltd., will be the chairman.

THE URUGUAYIAN GOVERNMENT MONOPOLY has entered into a contract for the purchase of 20,000 tons of petrol and 10,000 tons of petroleum from Russia during the coming year.

MR. CHARLES F. R. BROTHERTON, chairman of Brotherton and Co., Ltd., and Mr. John Russell leave Southampton today for Brazil and the Argentine. They will return early in June.

THE UNITED STATES RUBBER CO. reports a net loss of $9,473,404 (approximately £1,895,000) for 1931, after making inventory adjustments, charging certain amounts for plants closed down and after crediting unused reserves of $4,000,000 from the previous year. The net loss in 1930 was $18,063,940 (approximately £3,600,000 at par).

AT THE ANNUAL GENERAL MEETING of the Federation of British Industries on Wednesday, April 13, Sir George Beharrell was elected president of the Federation for the coming year, in succession to Sir James Lithgow. The vice-presidents were re-elected, with the addition of Mr. W. J. U. Woolcock and Sir Roland Nugent.

FOR THE FIRST TIME SINCE THE RECONSTRUCTION was completed in 1925, the Consett Iron Co.'s Angle Mills began the week's work on a Sunday last week-end. Three shifts of men are now being employed instead of the usual two. This announcement is regarded as the most promising step the company has taken for years, and holds out hope of a definite improvement in the iron and steel trade.

ATTENTION IS BEING DRAWN to the fact that trade marks registered in Great Britain are not necessarily registered in the Irish Free State. The use of the words "registered trade mark" and "registered" when a mark has not been registered with the Industrial and Commercial Property Office of the Department of Industry and Commerce, Dublin, is an offence making the trader liable to a fine.

A 10 PER CENT. REDUCTION in the import of Dutch coal into Belgium was proposed by the Belgian delegates at the Belgo-Dutch Coal Conference held on April 8. A corresponding reduction in the import of Belgian coal into Holland would naturally be made. No formal report was issued by the conference, as the Governments of both countries must first signify their approval of any arrangements to be made.

A DRAFT ORDER IN COUNCIL was laid before Parliament on April 6, in pursuance of Section 7 of the Merchandise Marks Act, 1926, requiring imported abrasive wheels, cylinders, cups, cones, discs, rollers, blocks, bricks, stones and sticks to bear an indication of origin on sale or exposure for sale in the United Kingdom. The draft Order is being published, and copies will be obtainable shortly from H.M. Stationery Office, Kingsway, W.C.2, either directly or through the usual channels.

THE RIGHT HON. YUKIO OZAKI, a distinguished Japanese statesman, was the speaker at the 52nd Individualist Luncheon at the Hotel Victoria, London, on Wednesday, at which Mr. W. W. Paine presided. The speaker, who has held the offices of Minister of Justice and Minister of Education and has also been Mayor of Tokio, and is a keen student of British politics, said he believed that no other country in the world could have come through the great political change of last autumn as Britain had done.

Obituary

PROFESSOR WILHELM OSTWALD, at Gross-Bothen, near Grimma, in Saxony, aged 79. Professor Ostwald was the originator of the present system of physical chemistry, and of the so-called doctrine of colours. He was born at Riga in 1853 and in 1909 received the Nobel Prize for Chemistry.

Kreuger-Toll Affairs

THE British Protective Committee requests that all British holders of shares or securities in the Swedish Match Co., the Kreuger and Toll Co., and the International Match Corporation will notify the secretary of the committee, Mr. D. Neylan, 80 Lombard Street, E.C.3, giving full particulars of their holdings, in order that the committee may know the extent to which British holders are interested and be able to communicate with such holders as occasion may require.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2. at 1s. each.

363,711. OXIDATION PRODUCTS OF HYDROCARBONS. J. Y. Johnson, London. From I. G. Farbenindustrie A.-G., Frankfort-on-Main.

Solid or liquid hydrocarbons which are to be oxidised are subjected to a preliminary purification by treating with hydrogen at 150°-450° C. and pressure of 5-500 atmospheres to remove sulphur compounds, but without substantial hydrogenation of the unsaturated hydrocarbons. The materials treated may be aliphatic, or naphthenic, solid or liquid hydrocarbons, such as petroleum middle oils, mineral or brown coal tars, low-temperature carbonisation tars, or hydrogenation products of coal, petroleum residues, etc. The hydrogenation may be effected in the presence of metals of groups 4-7 or their oxides or sulphides, which may be activated with sulphides and/or deposited on carbon or oxides of alkali or alkaline earth metals. A further desulphurisation with sulphuric acid or liquid sulphur dioxide may be effected. The hydrocarbons may be oxidised in liquid phase at 100°-200 C. with air, oxygen, or nitrogen oxides, in the presence of stearates or cinnamates of manganese, barium, or mercury, or in the gaseous phase at 200°-400° C. with air in the presence of oxides of molybdenum, chromium, bismuth or uranium. Examples are given.

363,810. SYNTHETIC RUBBER. J. Y. Johnson, London. From I. G. Farbenindustrie A.-G., Frankfort-on-Main.

Diolefines are polymerised by means of alkali or alkaline earth metals in the presence of hydrogen and in the absence of organic compounds containing oxygen. Solutions of the products show decreasing viscosities with increasing pressures of the hydrogen employed. The temperature may be 0°-120° C. and the pressure 0.5-50 atmospheres.

364,111. ABSOLUTE ALCOHOLS. R. W. James, London. From Merck and Co., Inc., Scott Avenue, Rahway, N.J., U.S.A.

Alcohol is dehydrated by adding 5-20 per cent. excess of lime and agitating continuously during refluxing and distilling of the alcohol. The lime is then obtained completely hydrated by adding the calculated quantity of water.

364,089. SYNTHETIC RUBBER. J. Y. Johnson, London. From *I. G. Farbenindustrie.*

Emulsions of diolefines are polymerised until 20-30 per cent. remains unpolymerised and the amount of polymerised diolefine soluble in benzene is a maximum. Styrene, vinyl compounds, esters of acrylic acid, fats or oils, or other polymerisible products may be present, and also catalysts and colloidal substances. Examples are given.

364,092. AMINES. Goodyear Tire and Rubber Co., 1144 East Market Street, Akron, Ohio, U.S.A.

Compounds having the general formula $R-CH_2-R_1-NH_2$ where R is anilino, amino, substituted anilino, alkylamino, substituted benzene, or amino substituted benzene, and R_1 is alkyl substituted benzene, amino substituted benzene, or alkylamino substituted benzene, are obtained by treating the product of arylamines and aldehydes with amino hydrochlorides, and are used as anti-oxidants for rubber, oils, soaps, aldehydes, etc.

364,134. HIGHER ALCOHOLS. O. Fuchs, 43 Beethovenstrasse, Constance, Baden, Germany, and W. Querfurth, 21 Nationalstrasse, Greuzlingen, Switzerland.

Butyl alcohol is obtained by passing ethyl alcohol vapour and hydrogen at atmospheric pressure over magnesia activated by oxides of lead, thorium, silver, uranium, tungsten, cadmium, tin, chromium, manganese, zinc, iron, nickel, cobalt or copper. The catalyst may be stabilised by adding aluminium hydroxide, stannic acid, silica gel, or wood charcoal. The reaction is effected at 200°-350° C. The product consists of *N*-butyl, hexyl and octyl alcohols, acetaldehyde and some butyric aldehyde and croton aldehyde.

364,221. ALCOHOL FROM ETHYLENE. Distillers Co., Ltd., 12 Torphichen Street, Edinburgh, W. P. Joshua, 1 Hillside, Finchley Road, London, and H. M. Stanley, 32 Second Avenue, Selby Park, Birmingham.

Ethylene is absorbed in sulphuric acid of less than 80 per cent. strength under increased temperature and pressure in the presence of materials which increase the surface contact of the reacting substances, such as pumice, porcelain, finely divided carbon, or silica gel. A liquid surface extender may also be used, such as a refined mineral oil, or a solid and liquid may be used simultaneously. The temperature is preferably below 200° C. and the pressure below 250 atmospheres.

363,681. COLLOIDAL DISPERSIONS. Elektrochemische Werke, München, A.-G., Hollriegelskreuth, Germany.

Colloidal dispersions of substances such as rubber or olive oil, are obtained by using a dispersing medium consisting of a dispersion of a solvent for the substance. Thus, rubber may be dissolved in benzene and the solution dispersed in an aqueous dispersion of benzene containing an oleate, and olive oil may be added to an aqueous dispersion of benzene, containing an emulsifying agent. The solvents may be recovered by heating.

363,685. MAGNESIUM CHLORIDE. *I. G. Farbenindustrie.*

Hydrated magnesium chloride is dehydrated by adding it, in such quantity that the proportion of $MgCl_2$ is always less than in carnallite, to an anhydrous melt of chlorides. The resulting fused mixture of chlorides may be electrolysed to obtain magnesium.

364,255. ACETALDEHYDE AND ACETIC ACID. J. Y. Johnson, London. From *I. G. Farbenindustrie.*

A mixture of acetylene, water vapour, and oxygen is passed over or through mercury heated to 300° C. so that the gases are laden with mercury vapour, and the mixture is then passed over a hydration catalyst heated to 100°-300° C. to obtain acetaldehyde or acetic acid. The catalyst may be mercuric phosphate which may be mixed with other heavy metal salts, metal oxides, or non-volatile acid compounds such as phosphoric, sulphuric, phospho-tungstic or tungstic acids, or their acid salts, or borates or chromates. Various metal oxides may be added to the catalysts, and they may be supported on carriers.

Specifications Accepted with Date of Application

369,301. Sulphonic acids particularly suitable for use as wetting out, emulsifying, dispersing, peptization, and cleansing agents, Manufacture of. Deutsche Hydrierwerke A.G. Sept. 29, 1930.

369,351. Pyrolysis of propylene. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Feb. 24, 1930.

369,363. Mixed esters, Production of—by means of polyhydric alcohols. H. A. Bruson. Mar. 4, 1930.

369,453. Hydroxy-benzocarbazoles, Manufacture of. I. G. Farbenindustrie. Apr. 30, 1930.

369,529. Alkali azides, Process and apparatus for the production of. J. Meissner. Nov. 10, 1930.

369,536. Magnesium, Production of—by electrolysis in a molten bath. I. G. Farbenindustrie. Nov. 8, 1930.

369,568 and 369,765. Vat dyestuffs, Manufacture of. A. Carpmael. (*I. G. Farbenindustrie.*) Dec. 19, 1930, and Apr. 13, 1931.

369,593. Alumina from aluminous silicious material, Recovery of. Electric Smelting and Aluminium Co. Dec. 26, 1929.

369,604. Vat dyestuffs, Manufacture of. I. G. Farbenindustrie. Dec. 22, 1930. Addition to 11940/30.

369,614. Organic compounds containing nitrogen, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie.*) Sept. 15, 1930.

369,674. Disulphuric acid ester of 2-amino-anthrahydroquinone, Production of. Imperial Chemical Industries, Ltd., D. A. W. Fairweather, and R. F. Thomson. Dec. 31, 1930.

369,690. Fatty acid nitriles, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie.*) Jan. 14, 1931.

369,710. Acetic anhydride, Manufacture of. Courtaulds, Ltd., and J. Brown. Feb. 2, 1931.

369,716 and 369,725. Conversion products of rubber, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie.*) Feb. 6, 1931.

369,798. Liquid hydrocarbons, Production of—by destructive hydrogenation of carbonaceous material. J. Maruhn and L. Tubben. May 26, 1931.

369,842. Tar from coal distillation gases, Removal of. C. Otto & Co., Ges. July 25, 1930.

369,850. Nitro-β-hydroxy-pyridine and nitro-β-hydroxy-alkyl-pyridines, Manufacture of. I. G. Farbenindustrie. Aug. 2, 1930. Addition to 33021/30.

369,852. Oxidation products of paraffin wax, Manufacture of. Standard I.G. Co. Aug. 14, 1930.

369,613. Condensation products from aromatic hydrocarbons, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie.*) Dec. 17, 1930.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Braun, J. Manufacture of pigment colours. 9893. April 6. (France, July 28, '31.)

Bromley, T. C. Apparatus wherein articles are treated with dyes, &c. 9980. April 7.

Canadian Electro Products Co., Ltd. Making catalysts for polymerising vinyl compounds. 9719. April 5. (United States, April 25, '30.)

Carbo-Norit-Union Verwaltungs Ges. Extraction of dissolved or suspended liquids, &c. 10148. April 8. (Germany, May 2, '31.)

Carpmael, A. (*I. G. Farbenindustrie*). Manufacture of artificial resins. 9787. April 5.

—— Softening agents for textile goods, &c. 10248. April 9 (Feb. 27, '31.)

Closmann, E. A. Apparatus for extracting substances from vegetable matter. 10250. April 9. (Germany, April 10, '31.)

Dreyfus, H. Manufacture of cellulosic compounds. 9809. April 5.

Du Pont de Nemours & Co., E. I. Extraction of solutes from solutions. 9673. April 4. (United States, April 4, '31.)

Fairweather, D. A. W., Imperial Chemical Industries, Ltd., and Thomson, R. F. Manufacture, &c., of N-sulphonic acids of carboxylamides. 9685. April 4.

—— Imperial Chemical Industries, Ltd., and Thomson, R. F. Production and application of vat dye powders. 9686. April 4.

Gibson, A. R., and National Process Co., Ltd. Electrolytic production of lead. 9995. April 7.

Greenstreet, C. J. Production of fatty acids from oils, &c. 10002. April 7.

Henkel et Cie Ges. Preventing formation of lumps during swelling of organic powders. 10018. April 7. (Germany, Aug. 26, '31.)

Hersey Manufacturing Co. Conditioning starch. 9672. April 4. (United States, April 4, '31.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of coating compositions, &c. 9609. April 4. (Germany, April 4, '31.)

—— Envelope for light sensitive photographic film. 10001. April 7. (Germany, April 8, '31.)

—— Process of improving hides, skins, &c. 10045. April 7. (Germany, May 6, '31.)

Imperial Chemical Industries, Ltd. Production and application of benzanthrone derivatives. 9801. April 5.

Johnson, J. Y. (*I. G. Farbenindustrie.*) Manufacture of vat dyestuffs. 9599. April 4.

—— Preparations for treatment of fibrous materials. 100228. April 9. (November 14, '30.)

Kodak, Ltd. Manufacture of cellulose acetate. 10130. April 8. (United States, April 13, '31.)

Lefebure, V., and Imperial Chemical Industries, Ltd. Calcium-sulphate plaster mixes, and methods of applying same. 9815. April 5. (Jan. 4.)

MacKenzie, R., and Stein & Co., Ltd., J. G. Production of alumina from clay, &c. 9851. April 6.

Shaw, C., and Thomson, R. F. Production and application of benzanthrone derivatives. 9801. April 5.

Universal Oil Products Co. Treatment of hydrocarbon oil. 9960, 9967. April 7. (United States, April 7, '31.)

Wacker Ges für Elektrochemische Industrie Ges., Dr. A. Manufacture of printing colours. 10000. April 7. Germany, May 9, '31.)

Wydler, E. Pigments for printing ink. 9938. April 7. (Switzerland, March 3.)

The Future of the Oil Industry

Lord Bearstead's Hopeful Views

ENCOURAGING views about the future of the oil industry were expressed by Viscount Bearsted at the annual dinner of the Oil Industries Club held in London on April 7. For many years past, he said, the consumption of oil had generally shown a steady increase, and it was only now in these times of economic crisis that over-production, or if they preferred, under-consumption, had burst upon them as a real, a public danger. Let them take care that they were not unduly alarmed by what he considered to be a temporary check to the progress of the industry. Even this year there was no marked falling off in consumption compared with the decrease in the consumption of other prime necessities, and he thought that the oil industry to-day, as a whole, was in a sounder position than any other. There was no real reason why oil should be over produced. He believed that the policy of conservation of oil resources, now so widely adopted, would prove that even though they were among the last to suffer from the crisis they would be the first to regain prosperity.

Points from Manufacturers' Literature

The Editor welcomes copies of new brochures and leaflets describing plant, equipment and products of interest to chemical manufacturers and the chemical using trades.

OXYGEN CUTTING MACHINES FOR ALL PURPOSES are described and illustrated in a brochure received from the British Oxygen Co., Ltd., of Angel Road, Edmonton, N.18. These machines are designed to meet the production requirements of engineers and equipment manufacturers, but some of them will be found particularly useful for chemical plant fabrication and repairs. One such machine is for tube cutting; this will cut steel tubes of any thickness up to 2 in. and of any diameter from 5 to 8 in. The British Oxygen Co. have also issued a small booklet entitled "Hints for Oxy-Acetylene Welding" in which some useful information is offered concerning the treatment of the various metals which are now worked by the welding process.

* * *

TANKS FOR THE TRANSPORT AND STORAGE of all liquids are illustrated in an attractive folder which has been received from Thompson Bros. (Bilston), Ltd., of Bilston, Staffs. This firm are pioneers in specialised tank work and made welded steel tanks and containers over 50 years ago, long before the days of bulk transport of liquids by road or rail. Prospective users of tank wagons are invited to select their chassis, and Thompson Bros. then produce the finished tanker complete with cab and other bodywork—painted and lettered—ready for the road. The "T.B." patented system of tank mounting enables the complete tank equipment to be rapidly lifted clear of the chassis for the substitution of an ordinary commercial body when and as required. Illustrations of sixteen tankers are given in this folder, capacities ranging from 250 to 3,000 gallons. In the majority of cases the tanks are of elliptical, and not cylindrical, section, as this particular form gives the lowest centre of gravity consistent with strength. Other advantages are that the radius of bottom eliminates any distortion due to hammer effects of the load on the bearers; there is complete drainage, a minimum tank weight for a given capacity, and a minimum number of holding-down bands are required. The actual tanks are sandblasted inside and out to remove all mill scale which may get into the valves when the tank is in service; this sandblasting also provides an effective key for the adherence of the paint. Another point of interest is that the corners on the ends of the tanks are ground off to a radius in order to avoid the necessity of stopping the welds prior to painting.

* * *

THE PREPARATION AND USE OF EMULSIONS is dealt with in a booklet issued by the Amoa Chemical Co., Ltd., of Marvels Lane, Grove Park, Lee, S.E.12 The object of this booklet is to enable any chemist or processor to prepare for his experiments and general use just the kind of emulsion he may desire for special requirements. Hitherto it has been generally believed, and in some quarters the belief still persists, that special complicated and costly machinery were preliminaries to the production of satisfactory emulsions reliably stabilised for practical applications in industry. By many years of research, however, this company has made the process of preparing emulsions one of simplicity, and the efficacy of such emulsions has now been proved beyond question by many large industrial concerns. Emulsions of any consistency from practically all mineral oils (whether heavy or light), fats, waxes, vegetable oils, fish oils, tars, bitumen, creosote, etc., may be prepared by carefully following the particulars set out in detail. Turning to the question of the stability of emulsions, it is stated that the degree of agitation, the speed of agitation, the time of running and the percentage of emulsifying agent all had their influence on the stability of an emulsion, apart from that of the state of purity of the water used. These factors had been carefully studied and provided for in the manufacture of "Amoa" emulsifying agents and in the devising of processes for them. A given emulsion should always be made in the same machine, by the same method, and with the same emulsifier, and the water used should always be as pure as possible. The function of the "Amoa" products, it is added, does not end in the emulsification of the oil, fat or wax; they also impart to the emulsions softening, wetting out and penetrating properties.

Weekly Prices of British Chemical Products

The following notes on the chemical market conditions in Great Britain are based on direct information supplied by the British manufacturers concerned, and unless otherwise qualified the figures quoted apply to fair quantities, net and naked at makers' works. Where no locality is indicated, the prices are general for the United Kingdom. Particulars of the London chemical market are specially supplied to THE CHEMICAL AGE *by R. W. Greeff and Co., Ltd., and Chas. Page and Co., Ltd., and those of the Scottish chemical market by Chas. Tennant and Co., Ltd.*

THERE has been a little improvement in the general demand for chemicals in London during the current week, with prices on the whole steady. The market for coal tar products is still firm, but prices remain unchanged. A general quietness is still prevalent in the Scottish chemical market. Prices on the whole are fairly steady. Business in chemical products on the Manchester market has been of a mixed description during the past week. Whilst most sellers have reported relatively quiet conditions, others have experienced a moderate demand for most of the leading heavy products. In most instances, however, transactions have related to small quantities and for near delivery dates. Delivery instructions in respect of old commitments continue on a fair scale on the whole. Taking prices generally, these are very steady although there have been no further rises of importance compared with a week ago. On the other hand, here and there it is evident that for the present, at any rate, values have passed the peak.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 40%, £19 15s. per ton d/d address U.K. in casks. London: Tech. 80%, £37 5s to £39 5s.; pure 80%, £38 5s. to £40 5s.; tech. 40%, £19 15s. to £21 15s.; tech. 60%, £28 10s. to £30 10s. SCOTLAND: Glacial 98/100%, £48 to £50; pure 80%, £38 5s.; technical 80%, £37 5s. d/d buyers' premises Great Britain. MANCHESTER: 80% commercial, £39; tech. glacial, £52.

ACID, BORIC.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in one-ton lots upwards.

ACID, CHROMIC.—11d. per lb., less 2½% d/d U.K.

ACID, CITRIC.—1s. 1d. per lb. LONDON: 1s. 1d. to 1s. 1½d., less 5%. MANCHESTER: 1s. 1½d.

ACID, CRESYLIC.—97/99%, 1s. 7d. to 1s. 9d. per gal.; 99/100%, 1s. 10d. to 2s.

ACID FORMIC.—LONDON: £50 per ton. *£52.

ACID, HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech.. 50% by vol., £23 10s. per ton; 50% by weight, £27 10s.; pale tech., 50% by vol., £27; 50% by weight, £32; 80% by weight, £52; edible, 50% by vol., £40. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £20 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £50 per ton in casks, £51 10s. in kegs. *£52 in casks d/d. SCOTLAND: 98/100%, £50 to £53 ex store. MANCHESTER: £2 10s. per cwt., ex store.

ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations: 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—1s. 1d. per lb. LONDON: 1s. 1d. to 1s. 1¼d. SCOTLAND: B.P. crystals, 1s. 1¾d. to 1s. 2d. less 5% carriage paid. MANCHESTER: 1s. 1d. to 1s. 1¼d.

ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.

ALUMINA SULPHATE.—LONDON: £8 5s. to £9 10s. per ton according to quality and quantity. *£8 10s. SCOTLAND: £8 to £8 10s. ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb. d/d, according to quantity.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £36 per ton; powdered, £38, packed in 5-cwt. casks d/d U.K. stations or f.o.b. U.K. ports.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton, carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

ANTIMONY OXIDE.—SCOTLAND: Spot £27 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 4d. to 1s. 6d. per lb. according to quality.

ARSENIC.—LONDON: £24 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £26 10s. f.o.r. mines. SCOTLAND: White powdered £27 ex wharf; spot, £27 10s. ex store. MANCHESTER: White powdered Cornish, £26 10s. at mines.

ARSENIC SULPHIDE.—Yellow 1s. 6d. to 1s. 8d. per lb.

BARIUM CHLORIDE.—LONDON: £11 10s. per ton. SCOTLAND: £11 5s.

BISULPHIDE OF LIME.—£7 10s. per ton f.o.r. London, packages free.

BLEACHING POWDER.—Spot 35/37% £7 10s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.

BORAX, COMMERCIAL.—Granulated £15 10s. per ton, powder £17, packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

CADMIUM SULPHIDE.—3s. 6d. to 3s. 9d. per lb.

CALCIUM CHLORIDE.—Solid 70/75% spot £5 5s. to £5 15s. per ton d/d station in drums. SCOTLAND: £5 5s. to £5 15s., according to quantity and point of delivery.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—4½d. to 5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £55 per ton, drums extra.

CHROMIUM OXIDE.—10d. to 10½d. per lb. according to quantity d/d U.K. Green 1s. 2d. per lb.

CHROMETAN.—Crystals 3¾d. per lb. Liquor £19 10s. per ton d/d U.K.

COPPERAS GREEN.—SCOTLAND: £3 15s. per ton, f.o.r., or ex works.

CREAM OF TARTAR.—LONDON: £5 2s. 0d. to £5 3s. per cwt.

FORMALDEHYDE.—LONDON: 28s. to 28s. 6d. per cwt. SCOTLAND: 40%, £28 per ton ex store.

HYDROGEN PEROXIDE.—LONDON: *100 vols. 10d. per lb.

LAMPBLACK.—£46 to £50 per ton.

LEAD ACETATE.—LONDON: White £42 to £44 per ton. Brown £1 per ton less. *£43 and £42 respectively ex wharf London. SCOTLAND: White Crystals £42 to £44 c.i.f. U.K. ports. Brown £1 per ton less. MANCHESTER: White, £38 to £39; Brown, £36 10s.

LEAD, NITRATE.—LONDON: £28 10s. to £29 per ton; MANCHESTER: £29.

LEAD, RED.—SCOTLAND: £28 10s. per ton d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £40 per ton carriage paid.

LITHOPONE.—30%, £20 to £22 per ton.

MAGNESITE.—SCOTLAND: Ground Calcined £9 per ton ex store.

METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. gal. Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial quality 64 O.P., 1s. 8d. to 2s. 3d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

NICKEL SULPHATE.—£38 per ton d/d.

PHENOL.—LONDON: *5½d. to 6¾d. per lb.

POTASH CAUSTIC.—£30 to £33 per ton. LONDON and MANCHESTER: £40 to £42.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5¾d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports with allowance for contracts. MANCHESTER: 5d.

POTASSIUM CARBONATE.—SCOTLAND: 96/98% spot £28 per ton ex store. LONDON: £32 to £33 10s. MANCHESTER: £30.

POTASSIUM CHLORATE.—3⅜d. per lb. export London in 1-cwt. kegs. LONDON: £37 per ton. SCOTLAND: 99¾/100% powder, £34. MANCHESTER: £35.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined Granulated £28 per ton c.i.f U.K. ports. Spot £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: B.P. crystals, 8½d. MANCHESTER: Commercial, 8d.; B.P., 8½d.

POTASSIUM PRUSSIATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.

SALAMMONIAC.—First lump spot, £42 17s. 6d. per ton d/d address in barrels.

SODA ASH.—58% spot, £6 per ton f.o.r. in bags, special terms for contracts.

SODA, CAUSTIC.—Solid 76/77° spot £14 10s. per ton d/d station. SCOTLAND: Powdered 98/99% £17 10s. in drums, £18 15s. in casks. Solid 76/77% £14 10s. in drums. 70/72% £14 12s. 6d. carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £12 15s. to £14 contracts.

SODA CRYSTALS.—Spot £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—97/98%, £21 per ton.

SODIUM BICARBONATE.—Refined spot £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 10s. ex quay or station. MANCHESTER: £10 10s.

* Prices quoted by other manufacturers.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous 5d. per lb. LONDON: 4d. per lb. with discounts for quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.

SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—2¾d. per lb. LONDON: £30 to £32 per ton. MANCHESTER: £30.

SODIUM CHROMATE.—3¾d. per lb. d/d U.K.

SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals £15 ex station 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.

SODIUM NITRITE.—Spot £19 to £22 per ton d/d station in drums.

SODIUM PERBORATE.—LONDON: *10d. per lb.

SODIUM PHOSPHATE.—£13 to £15 per ton f.o.r. London casks free. LONDON: Dibasic, £13 per ton. MANCHESTER: £13 10s.

SODIUM PRUSSIATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 5d. to 6d.

SODIUM SILICATE.—140° Tw. Spot £8 5s. per ton d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.

SODIUM SULPHATE (SALT CAKE).—Unground Spot £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 2s. 6d.

SODIUM SULPHIDE.—Solid 60/62% Spot £10 15s. per ton d/d in drums. Crystals Spot £7 15s. per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11 10s.; commercial, £8.

SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot £9 10s. d/d station in bags.

SULPHATE OF COPPER.—MANCHESTER: £18 per ton f.o.b.

SULPHUR.—£12 5s. to £15 15s. per ton. SCOTLAND: Flowers, £12 10s.; roll, £12 10s.; rock, £9. Ground American, £12 ex store.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.

SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

VERMILION.—Pale or deep, 6s. 4d. per lb.

ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—LONDON and SCOTLAND: £12 per ton.

ZINC SULPHIDE.—1s. to 1s. 2d. per lb.

Pharmaceutical and Photographic Chemicals

THE following changes are reported in the prices of pharmaceutical and photographic chemicals:—

BROMIDES, B.P.—AMMONIUM, 1s. 9d. per lb.; POTASSIUM, 1s. 6d.; SODIUM, 1s. 8d.

HEXAMINE.—2s. 7d. to 2s. 11d. per lb.

STRYCHNINE, ALKALOID, CRYST., 2s. 7½d. per oz.; POWDER, 2s. 6½d. per oz.

STRYCHNINE, ARSENATE.—2s. 7d. per oz.

STRYCHNINE, BISULPHATE.—2s. 1d. per oz.

STRYCHNINE, HYDROCHLORIDE.—2s. 4d. per oz.

STRYCHNINE, HYPOPHOSPHITE.—5s. 0½d. per oz.

STRYCHNINE, NITRATE.—2s. 2d. per oz.

STRYCHNINE, PHOSPHATE.—3s. 1½d. per oz.

STRYCHNINE, SULPHATE.—2s. 3½d. per oz.

Coal Tar Products

ACID, CARBOLIC (CRYSTALS).—5½d. to 6½d. per lb. Crude, 60's 1s. 5½d. to 1s. 6½d. per gal. SCOTLAND: Sixties, 1s. 7d. to 1s. 8d.

ACID, CRESYLIC.—99/100, 1s. 7d. to 1s. 8d. per gal.; B.P., 2s. to 2s. 3d.; Refined, 1s. 10d. to 2s.; Pale, 98%, 1s. 7d. to 1s. 8d.; Dark, 1s. 4d. to 1s. 4½d. LONDON: 98/100%, 1s. 6d. Dark 95/97%, 1s. 4d. SCOTLAND: Pale 99/100%, 1s. 3½d. to 1s. 4½d.; 97/99%, 1s. 1½d. to 1s. 2½d.; dark 97/99%, 1s. 0½d. to 1s. 1½d.; high boiling acid, 2s. 6d. to 3s.

BENZOL.—At works crude 7d. to 7½d. per gal. Standard motor, 1s. 2d. to 1s. 3d.; 90%, 1s. 3d. to 1s. 4d. Pure, 1s. 6d. to 1s. 7d. LONDON: Motor, 1s. 5½d. SCOTLAND: Motor, 1s. 3½d. to 1s. 4½d.; 90%, 1s. 9½d. to 1s. 10½d.

CREOSOTE.—Standard for export, 4⅜d. to 5d. nett per gal. f.o.b. for Home, 3¾d. d/d. LONDON: 3d. to 3½d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 4d. to 4¾d. SCOTLAND: Specification oils, 3¾d. to 4¼d.; washed oil, 4d. to 4½d.; light, 4d. to 4½d.; heavy, 4½d. to 5d.

NAPHTHA.—Solvent, 90/160, 1s. 3d. to 1s. 4d. per gal.; 95/160, 1s. 4d. to 1s. 5d.; 90/190, 11d. to 1s. 2d. LONDON: Solvent, 1s. 1½d. to 1s. 2d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160, 1s. 3d. to 1s. 3½d.; 90/190, 1s. 1d. to 1s. 2d.

NAPHTHALENE.—Purified crystals, £9 10s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 65s. to 70s.

PYRIDINE.—90/140, 3s. 9d. per gal.; 90/160, 4s. to 4s. 6d.; 90/180, 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 3s. to 4s.

REFINED COAL TAR.—SCOTLAND: 5d. to 5½d. per gal.

TOLUOL.—90%, 2s. 3d. per gal.; Pure, 2s. 7d.

XYLOL.—1s. 10d. per gal.; Pure, 2s. 1d.

Intermediates and Dyes

IN the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID, BENZOIC, B.P. (ex Toluol).—1s. 9½d. per lb.

ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.

ACID, SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.

BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.

o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL.—34.5° C.—1s. 9d. per lb., in ton lots.

DICHLORANILINE.—2s. 2d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.

DINITROBENZENE.—8½d. per lb.

DINITROTOLUENE.—48/50° C., 8¼d. per lb.; 66/68° C., 9d. per lb.

DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.

α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.

β-NAPHTHOL.—Spot, £75 per ton in 1-ton lots, d/d buyer's works.

α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.

β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 10d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½. per lb.; 5-cwt. lots, drums extra.

NITRONAPHTHALENE.—9d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.

o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb., d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 6d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. per ton. Grey, £12. Liquor, 8d. to 9d. per gal. MANCHESTER: Brown, £7 5s.; grey, £11.

ACETIC ACID, TECHNICAL, 40%.—£16 15s. to £17 15s. per ton.

ACETONE.—£63 to £65 per ton.

AMYL ACETATE, TECHNICAL.—95s. to 100s. per cwt.

IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gal.

WOOD CREOSOTE.—1s. to 2s. 6d. per gal., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. to 4s. per gal. Solvent, 3s. 9d. to 4s. 9d. per gal.

WOOD TAR.—£2 10s. to £6 per ton.

BROWN SUGAR OF LEAD.—£32 per ton.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—*Export.*—The market price remains unchanged at £5 5s. per ton f.o.b. U.K. port in single bags. The demand in consuming countries continues satisfactorily, but supplies are plentiful. *Home.*—The home demand continues brisk, but there appears to be a falling off from the heavy deliveries made during March. The price remains unchanged at £7 per ton delivered in 6-ton lots to consumers' nearest station.

NITRO-CHALK.—The demand continues to be satisfactory, and the price remains unchanged at £7 5s. per ton delivered in 6-ton lots to consumers' nearest station.

Latest Oil Prices

LONDON, April 13.—LINSEED OIL was firm for near positions. Spot, ex mill, £16 12s. 6d.; April, £13 15s.; May-August, £14 7s. 6d.; September-December, £15 7s. 6d.; January-April, £16 2s. 6d. naked. RAPE OIL was inactive. Crude extracted, £29 10s.; technical, refined, £31 10s., naked, ex wharf. COTTON OIL was dull. Egyptian crude, £21; refined common edible, £25; deodorised, £27, naked, ex mill. TURPENTINE was steadier. American, spot, 56s. 6d.; May-June, 54s. 9d. spot.

HULL, April 13.—LINSEED OIL, spot and April, closed at £13 10s.; May-August, at £14 2s. 6d.; September-December, at £15. COTTON OIL, Egyptian, crude, spot, £20 10s.; edible, refined, spot, £23; technical, spot, £23; deodorised, £25, naked. PALM KERNEL OIL, crude, f.m.q., spot, £22, naked. GROUNDNUT OIL, crushed/extracted, spot, £33 10s.; deodorised, £37 10s. RAPE OIL, crushed/extracted, spot, £28 10s.; refined, £30 10s. SOYA OIL, crushed/extracted, spot, £20; deodorised, £23 10s. per ton. COD OIL, nominal. CASTOR OIL, pharmacy, spot, 44s. 6d.; first, 39s. 6d.; second, 34s. 6d. per cwt.

* Prices quoted by other manufacturers.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

RECORD PRODUCTS, LTD., Record Works, Devonshire Road, Eccles, Lancs., polish manufacturers. (C.C., 16/4/32.) £27 14s. 9d. January 5.

CAMP DYERS AND CLEANERS (firm), Camp Road, Leeds, dyers. (C.C., 16/4/32.) £14 12s. 10d. March 3.

HIRD, Jack, 1167 Grangefield Avenue, Thornbury, Yorks., dyers' manager. (C.C., 16/4/32.) £18 18s. 6d. March 7.

Bill of Sale

HARRISON, Will, 27 Green Lane, Heywood, Lancs., leather dyer. (B.S., 16/4/32.) Date April 4, filed April 6. £30.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

ANGLO-AMERICAN PHARMACEUTICAL CO., LTD., Croydon. Registered April 4, £10,000 debenture stock, secured by Trust Deed dated March 31, 1932, present issue £7,653; general charge.

CASCELLOID, LTD., Leicester, manufacturers of celluloid, etc. Registered March 31, charge, to Westminster Bank, Ltd., securing all moneys due or to become due to the bank; charged on factory and premises in Abbey Lane, Leicester, etc. *£2,633. December 23, 1931.

JACKSON (THOMAS S.) & SONS, LTD., Mitcham, varnish manufacturers. Registered April 1, £4,000 debentures, to A. Ballard, 36 Tremaine Road, Anerley: general charge. *£5,000. March 21, 1930.

NATIONAL DRUG INDUSTRIES, LTD., London, S.W. Registered March 30, debentures, to National Bank, Ltd., securing all moneys due or to become due to the bank; charged on properties at Mile End, etc., also general charge.

Satisfaction

JACKSON (THOMAS S.) & SONS, LTD., Mitcham, varnish manufacturers. Satisfaction registered March 31, £5,000, registered August 1, 1929.

New Companies Registered

ALEXANDER BAKER AND CO., LTD., Vernon House, Shaftesbury Avenue, London, W.1. Registered March 24. Nominal capital £250 in £1 shares. Producers, refiners, manufacturers, storers, suppliers and distributors of mineral, vegetable and crude oils and any products of mineral and vegetable oil, or any chemical or other combination thereof, etc. Directors: I. C. Alexander and A. G. Baker.

HEXAMINE, LTD., 22 Buckingham Gate, Westminster, London, S.W.1. Registered March 29. Nominal capital £25,000 in £1 shares. Chemical and general engineers, manufacturers of chemicals and other products, etc.

H. MOORE AND SON, LTD., Littlemore Hill, Smethwick, Staffs. Registered April 1. Nominal capital £100 in £1 shares. To acquire the business of a druggists' sundriesman carried on by H. Moore at Littlemore Hill, Smethwick, Staffs. Directors: A. S. Price, Selwyn Road, Edgbaston, and H. Moore.

J. T. BOUTHRON, LTD., 263 Alderman Road, Knightswood, Glasgow. Registered in Edinburgh, April 1. Nominal capital £750 in £1 shares. Wholesale and retail chemists, drug store proprietors, dealers in toilet requisites, sanitary appliances, etc. Subscribers: J. I. Bouthron, Coaltoron, Markinch, Fife; and D. Hetherington.

MODERN PAINTS AND FINISHES, LTD. Registered April 2. Nominal capital £500 in £1 shares. Import and export merchants, manufacturers of and dealers in paints, cellulose and other lacquers, French polishes and chemicals, etc. Directors: E. G. Honeywill, Ellery Court, 36 Beulah Hill, Upper Norwood, S.E.19; and A. G. Walters.

RADIARD PROCESSES, LTD. Registered April 2. Nominal capital £3,000 in £1 shares. Manufacturers of, agents for and dealers in firelighters, firewood, matches, briquettes, and patent and other fuels, coal, coke, timber, oils, lubricants, paints, varnishes, soaps, chemicals, polishes, disinfectants, and decorators' materials, etc. Subscribers: H. Edwards, Cornhill Chambers, Christina Street, Swansea, and A. E. Goskar.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52 Chancery Lane, London W.C.2.

Opposition to Registration can be lodged up to April 30.

ABRACIDE.—529,600. Class 2.—Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes; 529,601. Class 3.—Chemical substances prepared for use in medicine and pharmacy. A. Boake, Roberts and Co., Ltd., 100 Carpenter's Road, Stratford, London, E.15. February 22, 1932.

MAXIMAC.—529,116. Class 2.—Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes, but not including phosphate fertilisers and not including any goods of a like kind to phosphate fertilisers. Cooper, McDougall and Robertson, Ltd., Ravens Lane, Berkhamsted.

NICTAGRAL.—529,947. Class 2.—Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester. March 5.

VIR-DIS.—529,852. Class 2.—Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes, but not including veterinary cures for distemper in dogs and not including any goods of a like kind to any of these excluded goods. Vir-dis Manufacturing Co., Superloid Works, Marks Tey, Essex. March 2.

Parent Coal Carbonisation Trust, Ltd.

IN the Companies Court on Monday, Mr. Justice Maugham had before him the petition for the winding up of the Parent Coal Carbonisation Trust, Ltd.

Mr. Greenland said this was a creditors' petition and the petitioning creditors had been satisfied in regard to their claim.

Mr. Heckscher, for the company, said a scheme was being prepared and he asked that the petition should be allowed to stand over until the first petition day in next sittings.

His lordship: Have the creditors been communicated with?

Counsel mentioned that the costs had been paid. The company was still carrying on business, but he was not aware if all the creditors had been communicated with.

His lordship directed the petition to stand over till the first petition day in next sittings.

Chemical Trade Inquiries

Abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

ABYSSINIA.—A local merchant desires to be placed into touch with exporters of slow setting Portland cement. (Ref. No. B.X. 7,304.)

BRITISH INDIA.—A firm of manufacturing agents in Bombay desires agencies for proprietory lines in drugs for Bombay Presidency and adjacent districts. (Ref. No. 646.)